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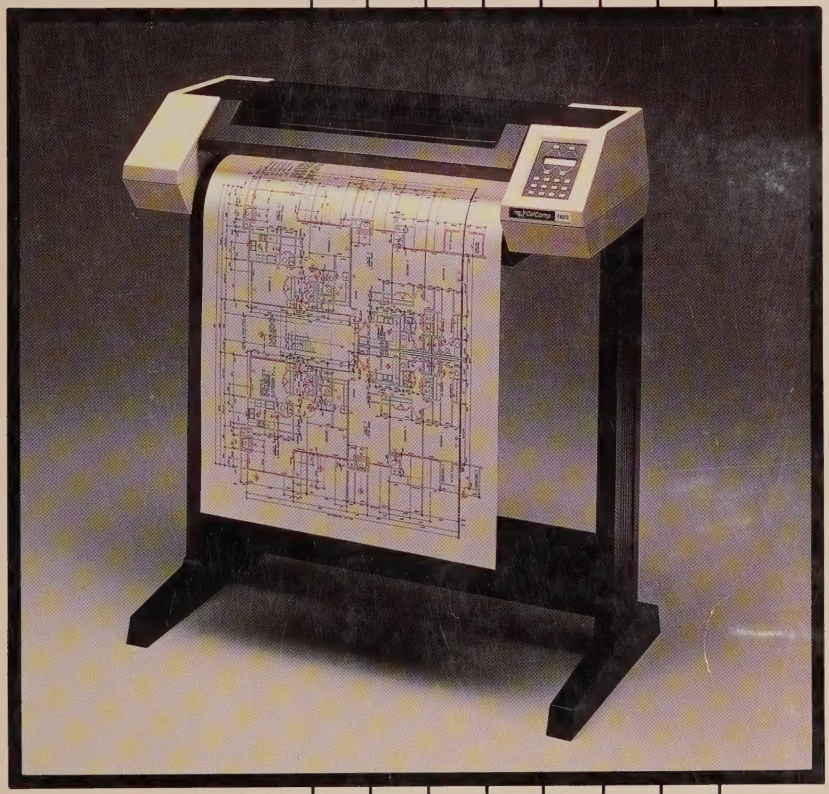
ARTISAN™



1023
User's Guide

CalComp

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Part No. 10321-901-001-1
Order No. M0010-700

ARTISAN ™
1023 PLOTTER
USER'S GUIDE

July 1988
Revision 1

CalComp
A Lockheed Company

PUBLICATIONS RECORD

Revision	Notes
-0	Initial release of manual
-1	Updates Model 1023 Plotter documentation

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The United States Federal Communications Commission (in 47CFR 15.838) has specified that the following notice be brought to the attention of users of this product.

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

"This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

'How to Identify and Resolve Radio-TV Interference Problems'.

This booklet is available from the U.S. Government Printing Office, Washington DC 20402, Stock No. 004–000–00345–4."

USE SHIELDED CABLES

To comply with FCC Class B requirements, all external data interface cables and adapters must be shielded.

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ROADCALC	ENGINEERING DATA SYSTEMS
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GENERAL INFORMATION

INTRODUCTION

The Artisan plotter (Figure 1-1) is a high-performance, high-quality, low priced pen plotter that is ideally suited for many CAD applications, including:

- Mechanical
- Electrical
- Electronic
- Structural
- Piping
- Mapping
- Civil engineering
- Architectural
- Facilities management
- Program management
- Mining
- Interior design

The plotter is easy to install and use. Each plotter is shipped preset for use with an IBM PC compatible host at 9600 baud using AutoCAD. In addition, a variety of other CAD software packages can be used. Its full-width grit drum can handle several types of cut-sheet media.

To start plotting with these popular combinations, a new plotter needs only to be connected, powered up, and loaded with pens and media. The preset conditions can be changed easily through use of the control panel.

The plotter can use a variety of pen types. A rotating pen turret stores up to eight pens in any combination of type, color, or width. To change pens, a pen carriage moves to the turret and makes the exchange. The plotter senses the pen type and automatically sets pen force and speed for optimum plot quality and throughput.

An optional memory expansion cartridge provides up to 2 MB of data storage capacity. This allows other tasks to be performed on the host while the Artisan is plotting. If AutoCAD is being used, an Autodesk Device Interface (ADI) allows saving even more time by downloading plots faster. The memory expansion cartridge also allows a replot feature to redraw the last plot without involving the host.

A proprietary Plot Manager feature increases throughput by optimizing pen movement and pen changes.

ABOUT THIS DOCUMENT

This document is organized into the following chapters.

- Chapter 1 *Getting Started* - Familiarizes the user with the plotter and describes how to load pens and media and run a confidence plot.
- Chapter 2 *Connecting the Plotter* - Describes how to connect an appropriate RS-232C interface cable between the plotter and a host computer.
- Chapter 3 *Configuring the Plotter* - Describes how to configure the plotter for host communications using a variety of different software packages.
- Chapter 4 *Operations* - Describes how to operate the plotter. A brief tutorial is provided to guide the first-time user through the operation.
- Chapter 5 *Pens and Media* - Describes how to select the appropriate pens and media combinations.
- Chapter 6 *Maintenance* - Describes how to clean the plotter and maintain and handle liquid ink pens.
- Chapter 7 *Problem Solving* - Serves as a guide to solve problems as a result of indicated symptoms.

- Appendix A *Specifications*
- Appendix B *CPGL Information*
- Appendix C *Obtaining Supplies/Service*
- Glossary

For initial installation, follow the procedures in Chapters 1 through 3. For subsequent operations, use the procedures in Chapters 4 through 7.

For ease of reference, the top of each left-hand page contains the major paragraph heading and each right-hand page contains the chapter heading.

SAFETY INSTRUCTIONS

- Follow all warnings and instructions marked on the plotter.
- Unplug the plotter from the power outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
- Do not use the plotter near water.
- If the type of power is not known prior to installing the plotter, consult your authorized dealer or local power company.
- Plotters have a three-wire grounding type plug (a plug having a third grounding pin). Such plugs fit into a grounding-type power outlet only. This is a safety feature. If you are unable to insert the plug into the power outlet, contact your electrician.
- Do not allow anything to rest on the power cord. Do not locate the plotter power cord where it can be walked on.
- If an extension cord is used with the plotter, ensure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating.
- Never push objects of any kind into the internal mechanisms of the plotter. Fire or electric shock may result.

- Except as explained elsewhere in this guide, do not attempt to service the plotter yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or put others at risk. Refer all servicing to a Sales and Support Office listed in Appendix C.

- If any of the following conditions exist, unplug the plotter from the power outlet and refer servicing to a Sales and Support Office listed in Appendix C.

  — The power cord or plug is damaged or frayed.

  — Liquid is spilled into the plotter.

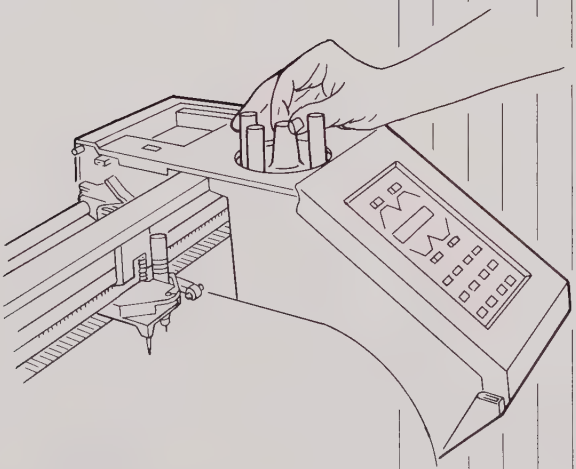
  — The plotter is exposed to rain or water.

  — The plotter does not operate normally when operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and require extensive work by a qualified technician to restore the product to normal operation.

  — The plotter is dropped or the cabinet is damaged.

  — The plotter exhibits a distinct change in performance, indicating a need for service.

CHAPTER ONE
GETTING STARTED



CHAPTER 1
GETTING STARTED

INTRODUCTION

This chapter familiarizes the user with the plotter (Figure 1-1) and describes how to load pens and media and run a confidence plot. In addition, procedures are provided for installing the optional memory expansion cartridge.

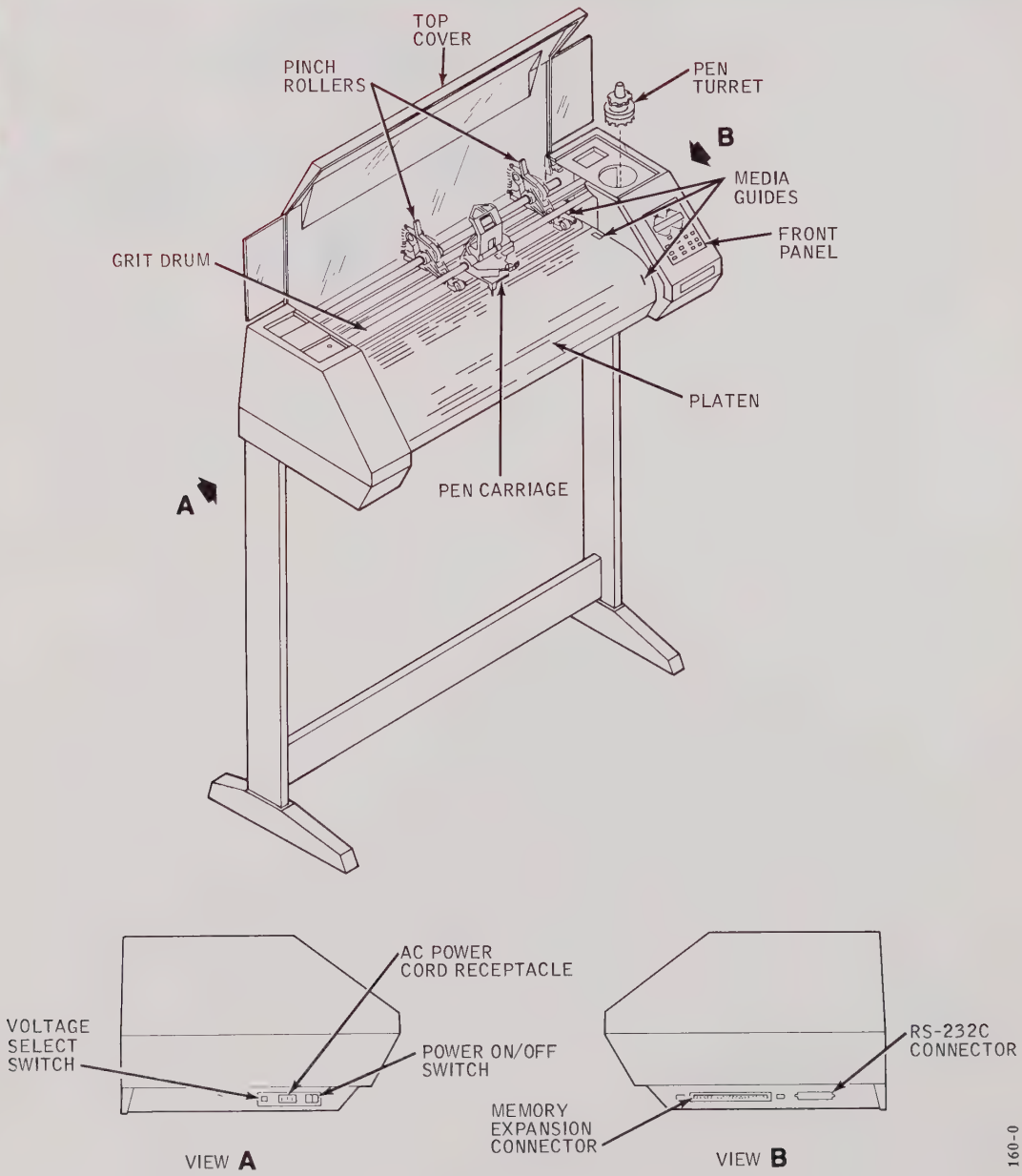


Figure 1-1. Artisan Plotter

- **Pen Turret** - Holds up to eight pens
- **Pen Carriage** - Selects pen from pen turret
- **Media Guides** - Used during media loading sequence to align a sheet
- **Pinch Rollers** - Holds media in place during sizing and plotting. Pulling lever towards you raises pinch rollers. Pushing lever away from you lowers pinch rollers.
- **Front Panel** - Contains controls and display to allow user to control the various modes and options of plotter operations
- **Platen** - Provides surface for holding and guiding media while performing plotting
- **Vacuum Fan** - (internal not shown) - Creates a vacuum to assist in holding media flat on platen during plotting and loading
- **Grit-Drum** - Moves the media during plotting
- **RS-232C Connector** - Accepts RS-232C interface cable connecting the plotter to a host computer
- **Memory Expansion Connector** - Accepts optional memory expansion cartridge
- **Voltage Select Switch** - Selects proper voltage level for the plotter

INSPECTION

The plotter and accessories are inspected prior to shipment. Compare the accessories received with the accessories listed in Table 1-1. If any accessories are missing, contact a CalComp Sales and Support Office listed in Appendix C.

TABLE 1-1. ACCESSORIES LIST

Item	Quantity	Part Number
A1-600 bond paper	6 sheets	10311-9244
WLB pen sampler	1	721-810-0
Black pen caps	12	649-420-7
Grit cleaning brush	1	650070-6
Pen turret	1	722300-1
Pen plotter supplies guide	1	G0270-Sup
Pen plotter supplies catalog	1	G0266-Sup
Guide to liquid inking	1	M0012-240
Power cable	1	

If any item is received damaged, contact a CalComp Sales and Support Office listed in Appendix C, and file a claim with the carrier if necessary.

NOTE

An RS-232C interface cable is required to connect the plotter to a host computer. Because the cable requirements vary from computer to computer, this cable must be purchased separately. Refer to Chapter 2 to determine the correct cable for your requirements.

TURNING THE PLOTTER POWER ON

The plotter is shipped with the voltage select switch set at 230 Vac. However, compare the voltage setting on the voltage select switch (Figure 1-1) with Table 1-2.

TABLE 1-2. VOLTAGE SELECT SWITCH

Outlet Voltage	Plotter Select Switch
180 Vac to 264 Vac	230 Vac
90 Vac to 132 Vac	115 Vac

If necessary, slide the voltage select switch to the appropriate setting. Check the wall plug end of the power cable. If it does not mate with the wall outlet, contact a CalComp Sales and Support Office listed in Appendix C.

WARNING

Use the power cable with a properly grounded receptacle to avoid electrical shock.

To connect the power cable and turn on the plotter, proceed as follows:

1. Insert the prongless (female) end of the power cable into the power socket on the left side of the plotter.

2. Insert the wall power plug (male) into a grounded power outlet.

3. Raise the plotter cover.

4. Raise the pinch rollers by pulling either pinch roller lever towards you.

5. At the left side of the plotter, press the MAIN POWER switch to **1**. Pressing the end marked **1** turns the power on. Pressing the end marked **0** turns the power off.

6. When power is applied, the following occurs:

   - The plotter performs initializing routines and the following is momentarily displayed on the front panel:

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     CalComp

   - At the completion of the power-on sequence, the following is displayed:

     (Media Loaded?)
     Lower pinch roll

LOADING THE PENS

The plotter can operate with any of the pens specified in Chapter 5. However, for this procedure use the pens from the accessories kit. Pens are loaded in pen positions (numbered 1 through 8) on the pen turret. To load one or more pens, proceed as follows:

1. Select a ***liquid ball*** pen from the sample pen kit supplied with the plotter.

2. Insert the pen into the turret as shown in Figure 1-2. *If **liquid ink** pens are used, it is necessary to change the turret pen caps. Refer to the procedure at the end of Chapter 5 for changing turret pen caps.*

3. Holding the pen at an angle, place the pen tip into the pen cap and depress the pen cap holder by pushing down on the top of the pen.

4. Move the pen cap into the turret pen jaws and slide the rim into the slot as shown in Figure 1-2. If the pen is loaded correctly, the rim should rest on top of the jaws.

5. Repeat the procedure for any additional pens to be loaded. The turret does not need to be fully loaded to operate correctly.

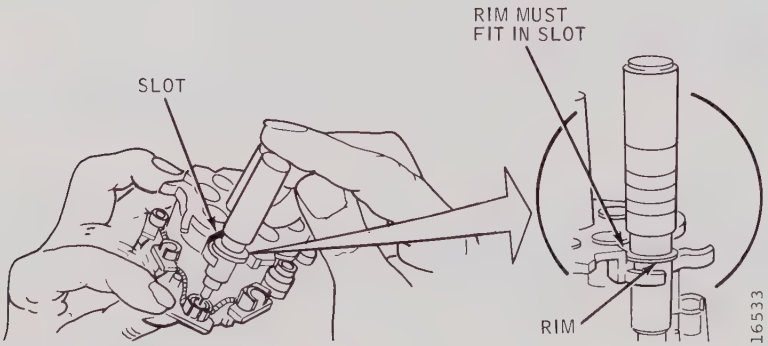


Figure 1-2. Loading Pens

NOTE

When using an applications program, note the pen color and type placed in each numbered pen position, so that you can tell the software which pen to use for various parts of the plot.

INSERTING THE PEN TURRET

The pen turret fits on a spindle located in the turret well. To load the turret, proceed as follows:

1. Refer to Figure 1-3.

2. Lower the loaded turret into the turret well until it is seated. The turret does not have to be oriented or indexed on the spindle.

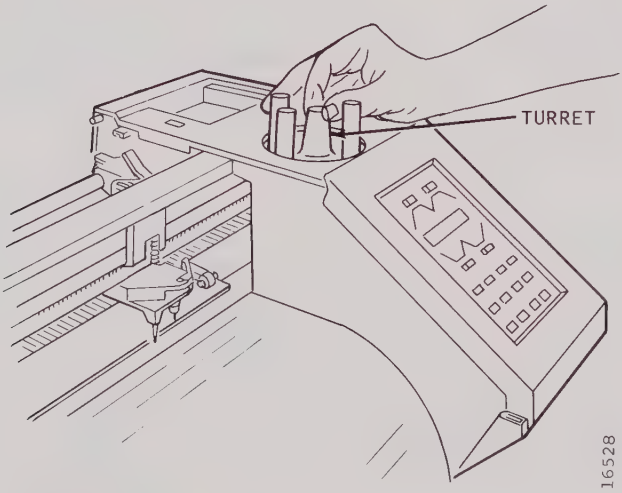


Figure 1-3. Loading the Turret

LOADING PLOTTING MEDIA

Plotting media can be any of the material specified in Chapter 5. However, for this procedure use the A1-600 bond media supplied in the accessories kit.

To load plotting media, proceed as follows:

1. Ensure that power is applied to the plotter.

2. Raise the plotter cover. The following is displayed on the front panel:

(Media Loaded?)
Lower pinch roll

   This display is prompting you to load media and lower the pinch rollers.

3. Obtain media to be loaded.

4. Refer to Figure 1-4.

5. While holding media by its edges, slide media over the front platen, under the pinch rollers and the pen carriage until media contacts the three stops. Two stops are located behind the right pinch roller and the other stop is located in front of the pen carriage.

6. Align edge of media to media guideline (cut mark located at front of platen).

NOTE

To avoid interference while loading media, the pen carriage can be moved manually while the pinch rollers are raised.

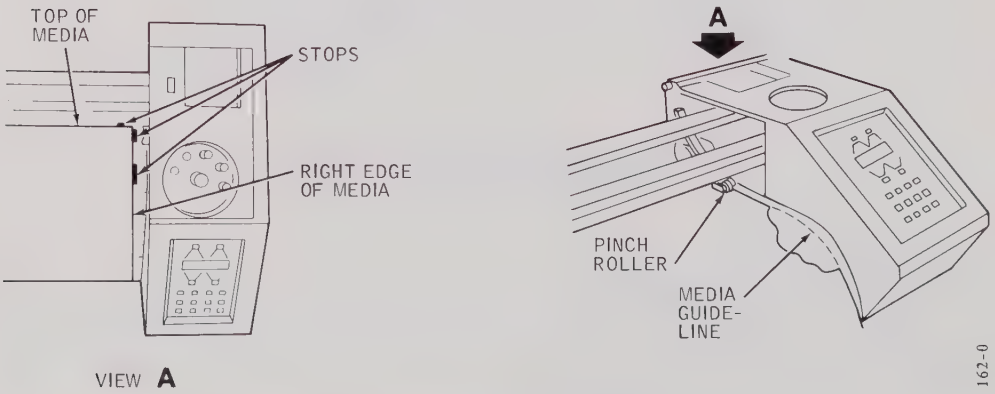


Figure 1-4. Media Alignment

7. To square up the sheet, push the upper right corner of the sheet against the stops as shown in Figure 1-4, View A and align the right edge of the sheet along media guidelines.

8. With the pinch rollers up, slide the left pinch roller over the left edge of the sheet. Move the roller by its "body" rather than by its lever. (Refer to Figure 1-5.)

9. Position the left pinch roller to approximately 1/8 inch (3 mm) from the left edge of the sheet, as shown in Figure 1-5.

11. Push down on the pinch roller lever after lowering the pinch rollers to ensure firm engagement of roller with media.

NOTE

When the plotter is not in use, raise the pinch rollers to prevent the rubber rollers from developing a flat spot.

12. Media is now aligned on the plotter. The following is displayed:

(Media Loaded?)
Lower cover

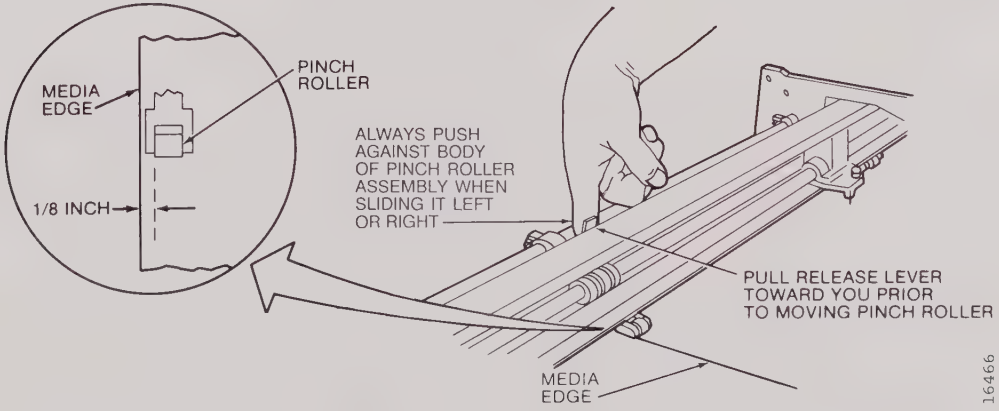

MEDIA EDGE
PINCH ROLLER
1/8 INCH
ALWAYS PUSH AGAINST BODY OF PINCH ROLLER ASSEMBLY WHEN SLIDING IT LEFT OR RIGHT
PULL RELEASE LEVER TOWARD YOU PRIOR TO MOVING PINCH ROLLER
MEDIA EDGE
16466

Figure 1-5. Pinch Rollers

10. Lower the pinch rollers by pushing one of the pinch roller levers towards the rear of the plotter. This action lowers both pinch rollers.

13. Lower the top cover. The following should be displayed:

Select One:	
Online	Manual

FRONT PANEL DESCRIPTION

The following procedure provides a brief overview of the front panel sufficient to perform a confidence plot. Chapter 4, Operations, contains a detailed description of the various modes of operation of the plotter.

The front panel (Figure 1-6) contains the following elements:

- Liquid Crystal Display (LCD)
- Four soft keys
- EXIT key
- NEXT key
- Numeric/axis direction keys

LIQUID CRYSTAL DISPLAY (LCD)

The LCD can display the following:

- Menu options
- Messages
- Prompts

The soft keys are used to select the corresponding menu options. The use of the soft keys and the menu options forms a versatile, menu-driven system.

Throughout the remainder of this document, whenever it is necessary to press a soft key as a result of an operation, the appropriate display is shown, and the associated soft key is shown shaded.

NEXT Key

The NEXT key is used to display the next page of a multipage menu.

EXIT Key

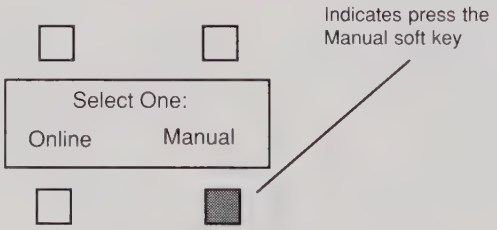
The EXIT key is generally used to exit a menu or a mode of operation.

Numeric/Axis Direction Keys

(Not used during confidence plot)
These keys are multifunction keys and are used as follows:

- To enter numeric values when prompted by the LCD
- To select a pen during the pen selection sequence
- To position the pen carriage in the direction indicated on the key

Example:



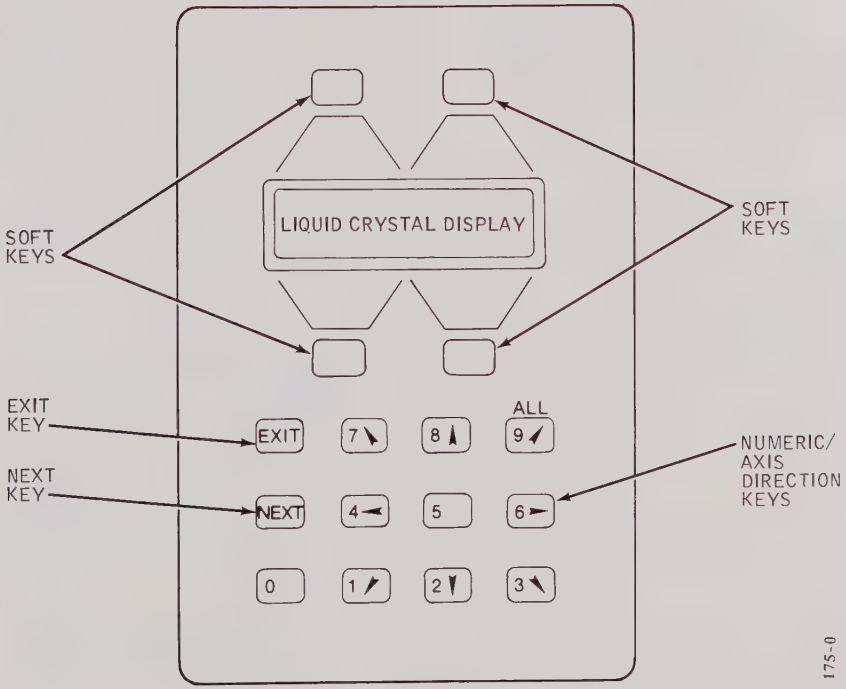


Figure 1-6. Front Panel

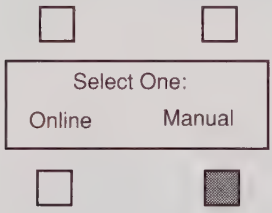
CONFIDENCE PLOT

The confidence plot is an internally stored program that is run to demonstrate the integrity of the plotter. This plot is automatically scaled to fit the size of the sheet loaded. To run the confidence plot, proceed as follows:

1. Ensure that the following have been performed:

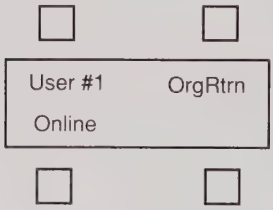
- Turret with pen loaded into plotter
- Media loaded and aligned
- Pinch rollers down and engaged
- Cover lowered

2. The following is displayed:

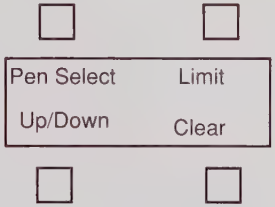


3. Press the Manual soft key. The following occurs:

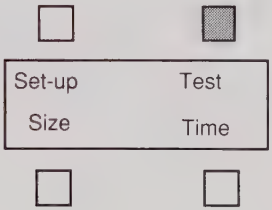
- The plotter moves the pen carriage and media to determine the size of the media.
- The following is displayed:



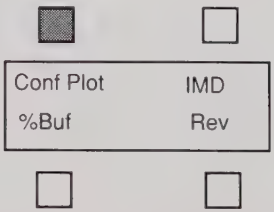
4. Press the NEXT key. The following is displayed:



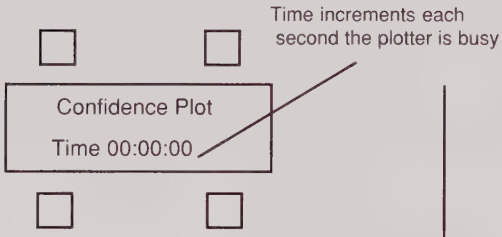
5. Press the NEXT key. The following is displayed:



6. Press the Test soft key. The following is displayed:



7. Press the Conf Plot soft key. The following is displayed:



- The pen carriage takes the pen from the turret and positions the pen on the media surface.

- The plotter draws the confidence plot using a combination of x-and y-vector lines to create the plot. X-axis lines are created by rotation of the grit drum moving the sheet under the pen. Y-axis lines are created when the pen is moved across the platen.

- A sensor reads the pen bands printed on the body of the pen and translates this information into pen parameters (speed, acceleration, and force values) that optimize throughput and quality. The plotter is designed for use with CalComp patented pens. Use of other vendors' supplies may not work as well as those products designed and supplied for this plotter.

8. After the confidence plot is completed, raise the cover, the pinch rollers and remove the plot.

NOTE

Each time the pinch rollers are raised, control of the plotter returns to the sizing sequence.

9. The plot should appear as shown in Figure 1-7. If it does not, repeat the procedure. If the plot still does not look like Figure 1-7, contact a CalComp Sales and Support Office listed in Appendix C.

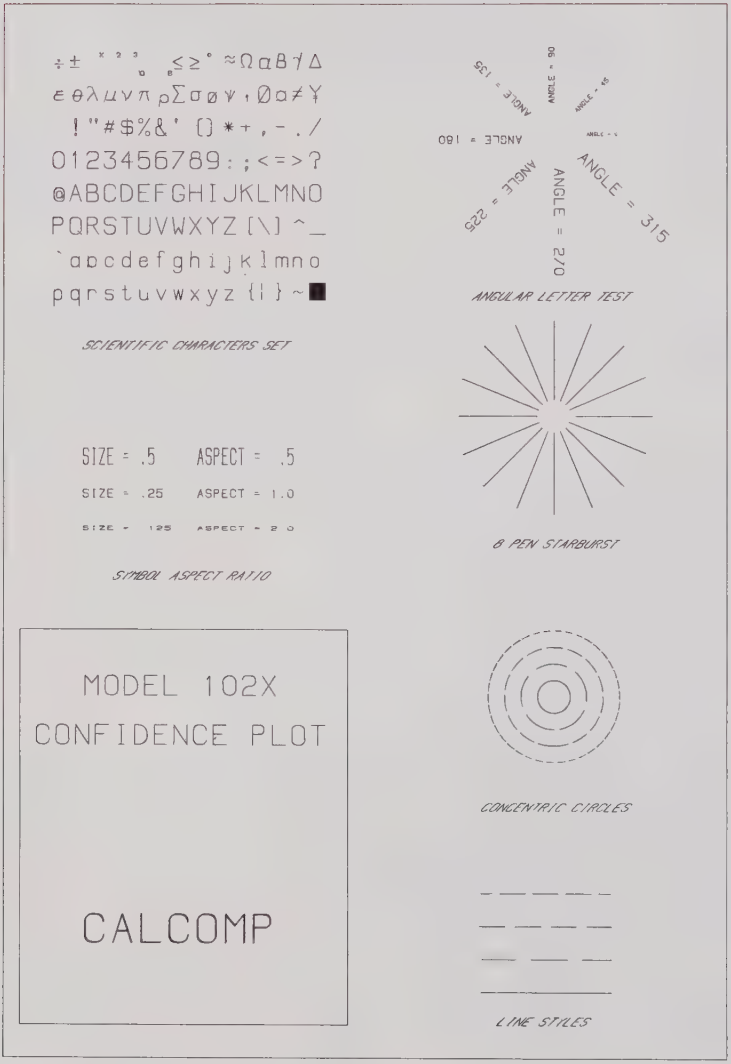

÷ ± ≤ ≥ ° ≈ Ω α β γ Δ
ε θ λ μ ν π ρ Σ σ ø ¥ , Ø ¤ ≠ ¥
! " # $ % & ' ( ) * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ?
@ A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [\ ] ^ _
` a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~
SCIENTIFIC CHARACTERS SET
ANGLE = 90
ANGLE = 135
ANGLE = 45
ANGLE = 180
ANGLE = 225
ANGLE = 270
ANGLE = 315
ANGULAR LETTER TEST
SIZE = .5 ASPECT = .5
SIZE = .25 ASPECT = 1.0
SIZE = .125 ASPECT = 2.0
SYMBOL ASPECT RATIO
8 PEN STARBURST
MODEL 102X
CONFIDENCE PLOT
CALCOMP
CONCENTRIC CIRCLES
LINE STYLES
16478

Figure 1-7. Confidence Plot

OPTIONAL MEMORY EXPANSION CARTRIDGE

The optional memory expansion cartridge provides additional plotter memory. This option provides two features.

1. Allows the storing of plot data from the host to the plotter. This allows the host to perform other operations while the plotter is plotting.

2. Allows running a replot of a stored drawing without having to send the plot data from the host again.

The procedures for using the replot feature are at the end of Chapter 4. Using the replot feature requires some experience with the other menu options. Therefore, it is recommended that the user become familiar with the basic operations outlined in Chapter 4 prior to using the replot feature. However, the memory expansion cartridge may be installed without any effect on the other operations.

Memory Expansion Cartridge Installation

To install the memory expansion cartridge proceed as follows:

1. Ensure the plotter is powered off.

2. Remove the plastic connector cover by pushing on the edge of the cover (Figure 1-8).

3. Remove the memory expansion cartridge from its packing box.

4. Check the label and verify that the memory expansion cartridge is the correct model (1MB, 2MB).

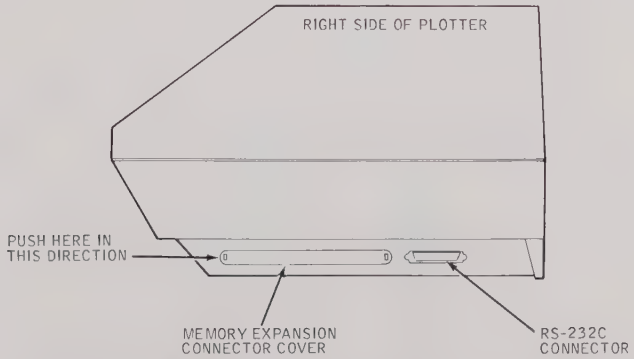


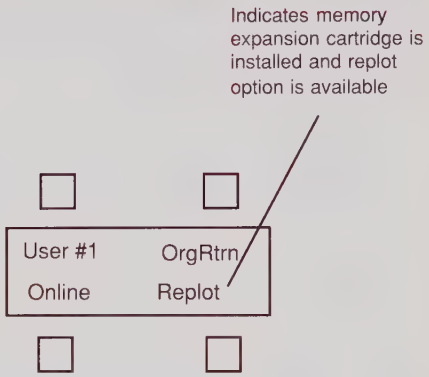
Figure 1-8. Memory Expansion Connector

5. Hold the memory expansion cartridge with the label facing up.

6. Insert the memory expansion cartridge (Figure 1-9) into the connector until the locking tabs are seated. Do not force the cartridge into the connector. This can result in damage to the cartridge and/or internal components of the plotter.

7. Turn the plotter power on.

8. Load media and press the Manual soft key. After sizing media, the following should be displayed:



9. If the message, *Auxiliary RAM Problem* is displayed, it indicates a problem with the memory expansion cartridge. Power-off the plotter, remove the cartridge, and contact a CalComp Sales and Support Office listed in Appendix C.

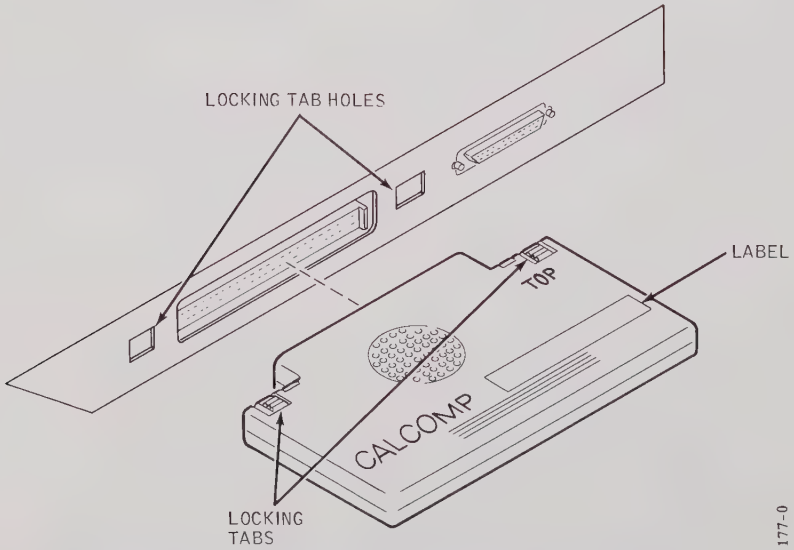


Figure 1-9. Memory Expansion Cartridge

Memory Expansion Cartridge Removal

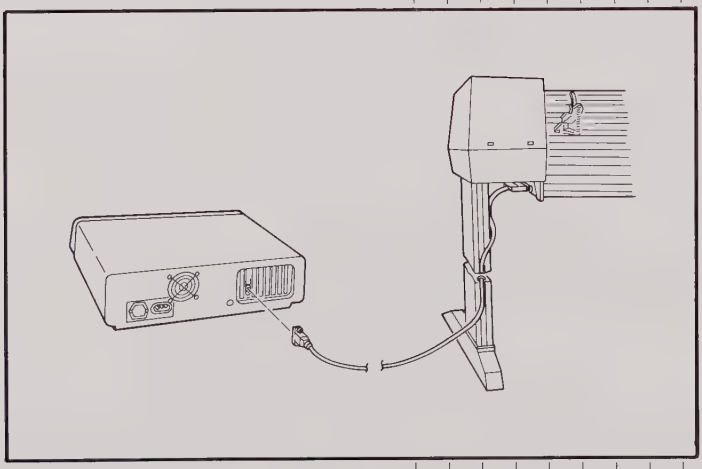
To remove the memory expansion cartridge proceed as follows:

1. Turn the plotter power off.

2. Squeeze the top and bottom locking tabs on both sides of the cartridge (Figure 1-9) and at the same time pull outward on the cartridge until it clears the locking tab holes.

3. Remove the cartridge.

CHAPTER TWO
CONNECTING THE PLOTTER



CHAPTER 2
CONNECTING THE PLOTTER

INTRODUCTION

The Artisan plotter communicates with a host computer via an RS-232C interface. Since there are many variations of this interface, the following variables must be considered when connecting the plotter to the host:

- *DTE-Data is transmitted on pin 2 and received on pin 3.*
- *DCE-Data is transmitted on pin 3 and received on pin 2.*

- Is the host interface configured for DTE (Data Terminal Equipment) or DCE (Data Communications Equipment)?
- Does the host interface use a 9-pin or 25-pin connector?
- Is the host connector male or female?
- Are all the RS-232C signals used or only some of the signals?
- Does your software require a special cable configuration?

This chapter provides information to allow the user to connect the RS-232C interface between the plotter and the host computer.

PLOTTER INTERFACE

The Artisan plotter interface is configured as Data Communications Equipment (DCE). The connector is a 25-pin female (Figure 2-1). Table 2-1 shows the pin assignments.

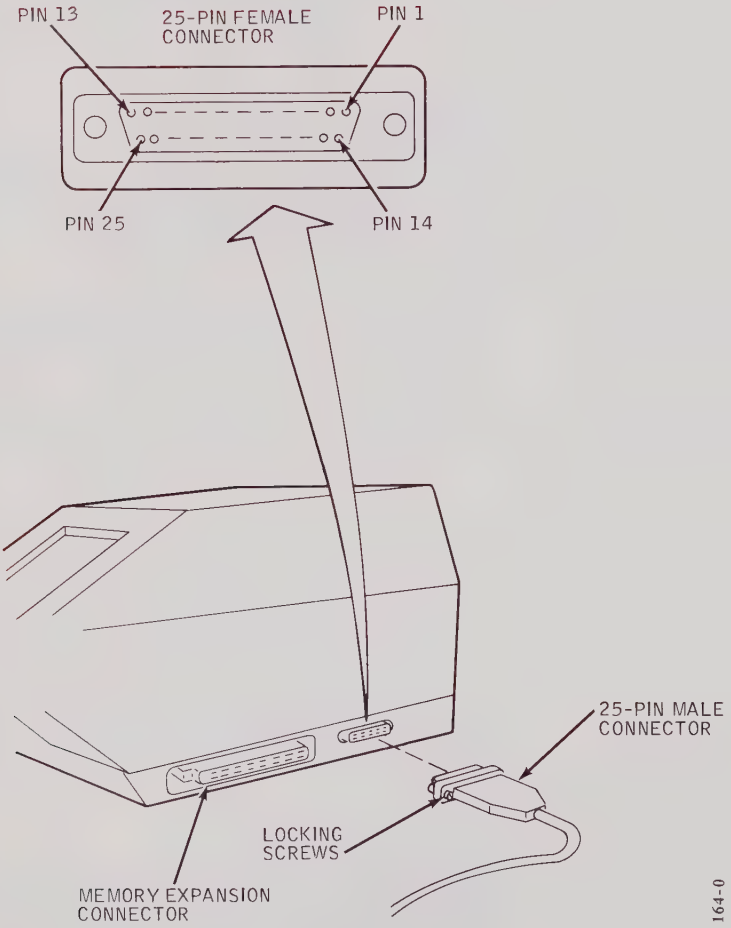


Figure 2-1. RS-232C Connector

TABLE 2-1. RS-232C CONNECTOR PIN ASSIGNMENTS

Pin No.	Name	Description	Direction
1		Shield Chassis Ground	
2	TD	Transmitted Data	Data to Plotter
3	RD	Received Data	Data from Plotter
4	RTS	Request to Send	Signal to Plotter
5	CTS	Clear to Send	Signal from Plotter
6	DSR	Data Set Ready	Signal from Plotter
7	SGND	Signal Ground	
8	DCD	Data Carrier Detect	Signal from Plotter
9		Not used	
10		Not used	
11		Not used	
12		Not used	
13		Not used	
14		Test	Plotter internal use
15		Not used	
16		Test	Plotter internal use
17		Test	Plotter internal use
18		Not used	
19		Reserved (pull-up)	
20	DTR	Data Terminal Ready	Signal to Plotter
21		Not used	
22		Not used	
23		Not used	
24		Not used	
25		Reserved (pull-down)	

HOST COMPUTERS

Information is provided to support the following most commonly used host computers:

- IBM PC or equivalent (Figure 2-2)
- IBM XT or equivalent (Figure 2-2)
- IBM AT or equivalent (Figure 2-2)
- IBM PS/2 or equivalent (Figure 2-3)
- DEC VAX (Figure 2-4)
- Apple Macintosh II (Figure 2-5)

CABLES / CONNECTORS

Cable diagrams are provided for the following cable/connector configurations:

- 25-pin male (DCE) to 25-pin female (DTE)—Table 2-2
- 9-pin female adapter (DTE) to 25-pin male (DCE)—Table 2-3
- 25-pin female (DCE) to 25-pin male (DCE)—Table 2-4

CABLE CONNECTION

Using the information in Tables 2-2 through 2-4 and Figures 2-2 through 2-5 , obtain or fabricate the appropriate cable and/or adapter. The cable length must not exceed 50 feet.

CAUTION

Double-shielded cable must be used. Failure to comply violates FCC and VDE Class B regulations.

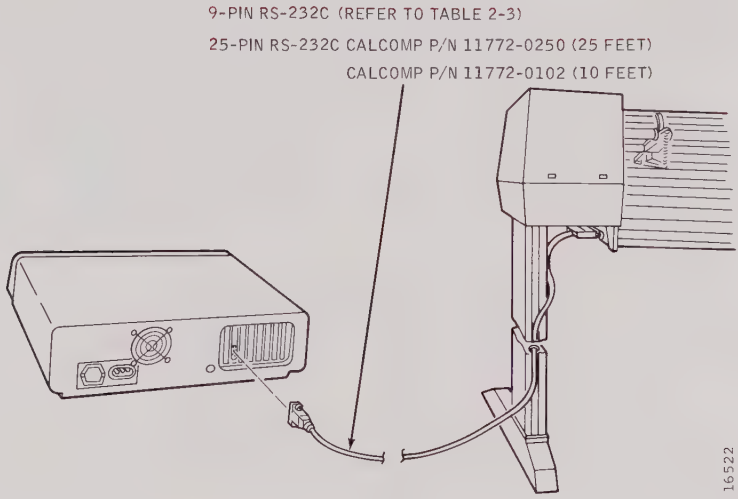


Figure 2-2. IBM PC, XT, AT, or Equivalent

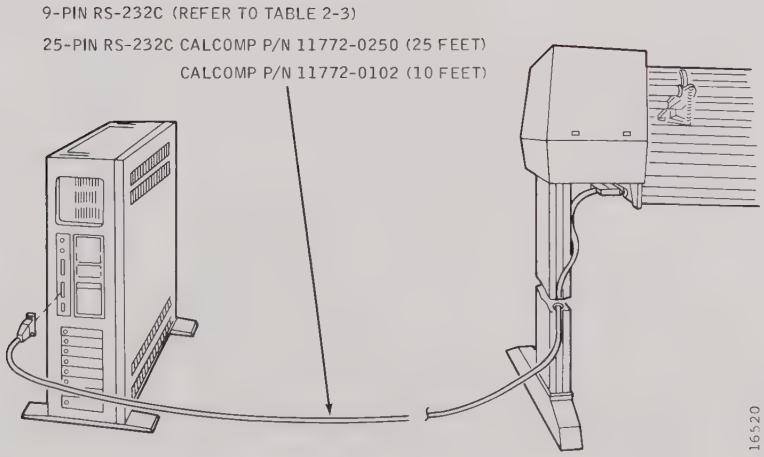


Figure 2-3. IBM PS/2 or Equivalent

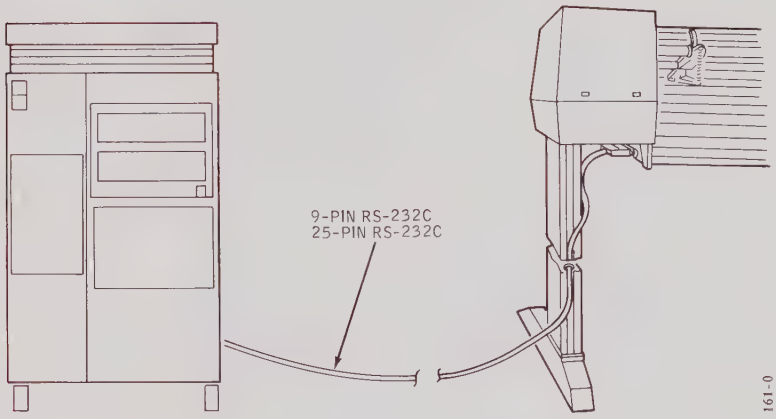


Figure 2-4. DEC VAX

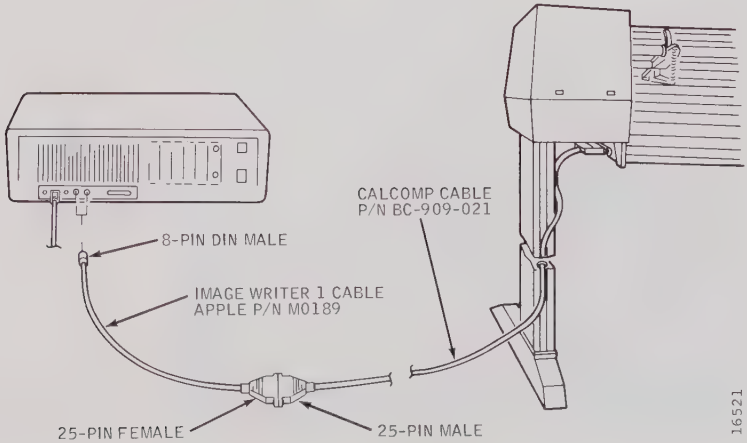


Figure 2-5. Apple Macintosh II

TABLE 2-2. INTERFACE CABLE, CALCOMP P/N 11772 -0250, -0102 *

EIA Circuit	CCITT Circuit	DTE Host Male Term	DTE Host Male Pin	RS-232 Cable 25-Pin Female Pin	RS-232 Cable 25-Pin Male Pin	DCE Plotter Female Pin
AA	101	GND	01	01	01	01
BB	103	TD	02	02	02	02
BA	104	RD	03	03	03	03
CA	105	RTS	04	04	04	04
CB	106	CTS	05	05	05	05
CC	107	DSR	06	06	06	06
AB	102	SG	07	07	07	07
CF	109	CD	08	08	08	08
			09	09	09	09
			10	10	10	10
			11	11	11	11
SCF	122		12	12	12	12
SCB	121		13	13	13	13
SBA	118		14	14	14	14
DB	114	SCT	15	15	15	15
SBB	119		16	16	16	16
DD	115	SCR	17	17	17	17
			18	18	18	18
SCA	120		19	19	19	19
CD	108.2	DTR	20	20	20	20
CG	110	SQ	21	21	21	21
CE	125	RI	22	22	22	22
CH	111		23	23	23	23
DA	113	TRC	24	24	24	24
			25	25	25	25

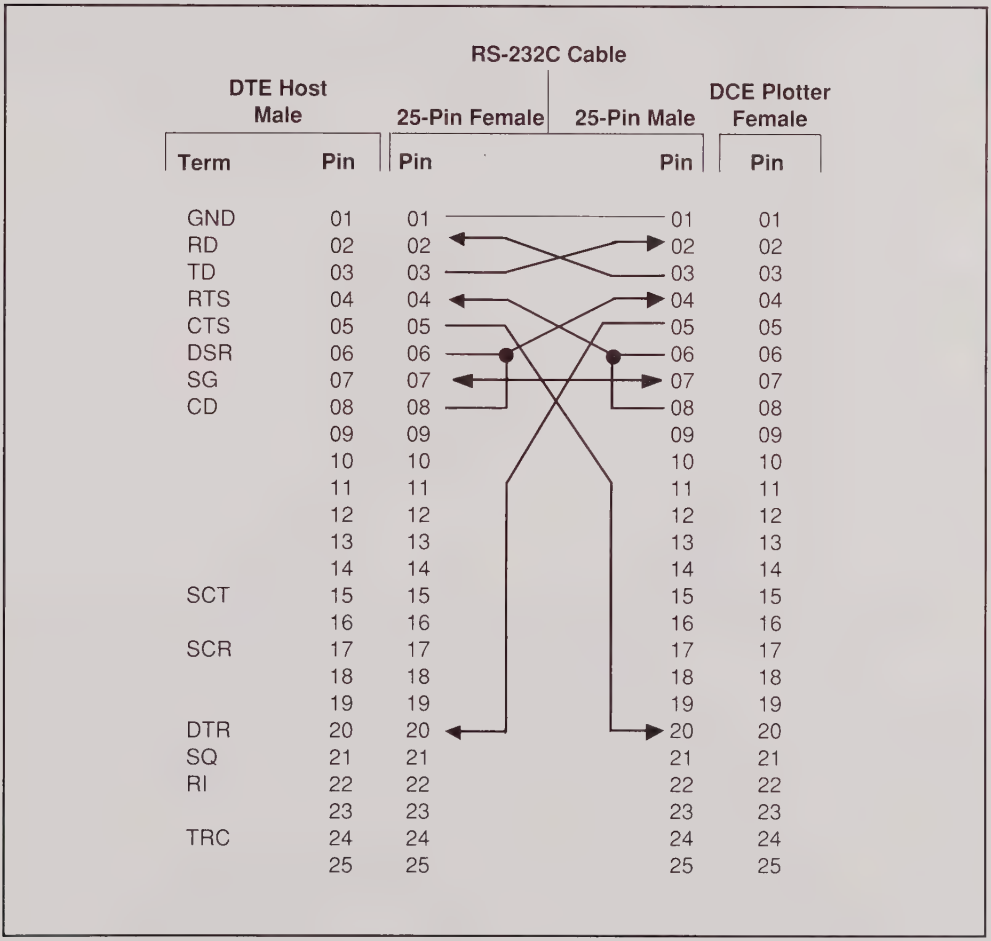
*** -0250 = 25 feet**
-0102 = 10 feet

TABLE 2-3. INTERFACE CABLE, 9-PIN FEMALE TO 25-PIN MALE

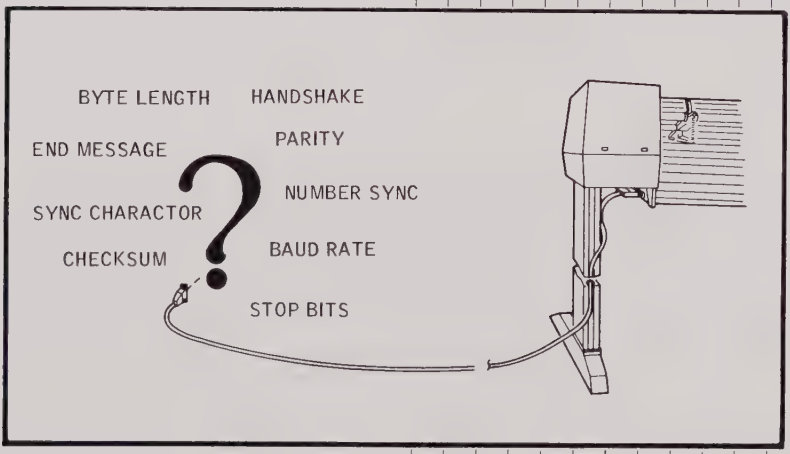
RS-232C Cable

DTE Host Male		9-Pin Female		25-Pin Male	DCE Plotter Female
Term	Pin	Pin		Pin	Pin
				01	01
TD	03	03	→	02	02
RD	02	02	←	03	03
RTS	07	07	→	04	04
CTS	08	08	←	05	05
DSR	06	06	←	06	06
SG	05	05	—	07	07
CD	01	01	←	08	08
				09	09
				10	10
				11	11
				12	12
				13	13
				14	14
				15	15
				16	16
				17	17
				18	18
				19	19
DTR	04	04	Not used	20	20
				21	21
RI	09	09	Not used	22	22
				23	23
				24	24
				25	25

TABLE 2-4. INTERFACE CABLE, 25-PIN FEMALE TO 25-PIN MALE CROSSOVER



CHAPTER THREE
CONFIGURING THE PLOTTER



CHAPTER 3
CONFIGURING THE PLOTTER

INTRODUCTION

The plotter is compatible with computer-aided design (CAD) programs that use any of the following formats:

- 960 Mode (CalComp 960 Data Format) — used with CAD programs supporting older plotters
- PCI Mode (CalComp Online Controller Format) — used with CAD programs supporting later released plotters
- CPGL Mode (CalComp Plotter Graphics Language) — used with CAD programs supporting the Hewlett Packard Graphics Language (HPGL)

While installing the CAD program on the host computer, the CAD program may prompt for the plotter used. If the CAD program was released prior to 1988, the Artisan plotter may not be listed. In that event, if the CalComp 1040 Series is listed, select it as the substitute. If the 1040 Series is not listed, refer to your software manufacturer's requirements.

HOST COMMUNICATION PARAMETERS

Table 3-1 lists the parameter type, associated specifications, and the factory defaults.

Table 3-2 lists the various PCI compatible software packages and associated parameters.

Table 3-3 lists the 960 compatible software packages and associated parameters.

To change parameters, refer to Figure 3-1. Figure 3-1 is a flow diagram that will guide you to the appropriate table and procedures to allow changes based on the software package installed.

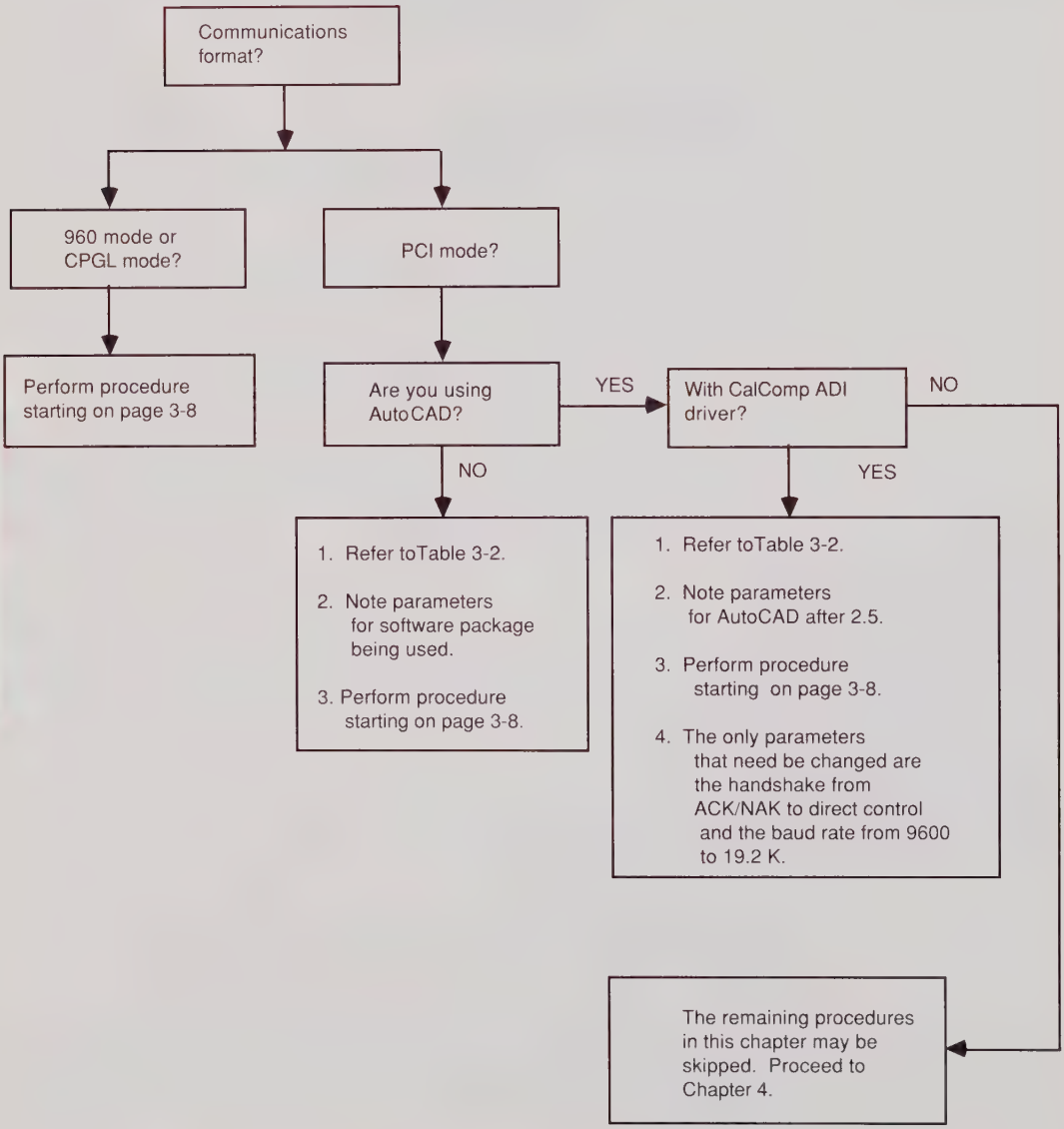

Communications format?
960 mode or CPGL mode?
PCI mode?
Perform procedure starting on page 3-8
Are you using AutoCAD?
YES
With CalComp ADI driver?
NO
NO
YES
1. Refer toTable 3-2.
2. Note parameters for software package being used.
3. Perform procedure starting on page 3-8.
1. Refer toTable 3-2.
2. Note parameters for AutoCAD after 2.5.
3. Perform procedure starting on page 3-8.
4. The only parameters that need be changed are the handshake from ACK/NAK to direct control and the baud rate from 9600 to 19.2 K.
The remaining procedures in this chapter may be skipped. Proceed to Chapter 4.

Figure 3-1. Configuration Guide

TABLE 3-1. ARTISAN COMMUNICATION PARAMETERS

Parameter	Specification	Default
Format	PCI, 960, CPGL	PCI Mode
Baud Rate	110, 150,300, 600, 1200, 2400, 4800, 9600, 19.2K	9600
Byte Length	7 or 8 bit	7 bit
Stop Bits	1 or 2	1
Parity	odd, even, no(none)	even parity
Handshake	ACK/NAK, Xon/Xoff, Direct Control	ACK/NAK
Sync Char	0 to 127	22
Number Sync	1 or 2	2
End Message	0 to 31	13
Checksum	enabled or disabled	enabled

TABLE 3-2. PCI FORMAT PARAMETERS

Name	Baud Rate	Byte Length	Stop Bits	Parity	Hand-shake	Sync Char	Number Sync	End Message	Checksum
ANVILL-1000	9600	8 bit	1	none	Direct Control	2	1	3	Enabled
ARCOS	4800	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
AUTOCAD	9600	7 bit	1	even	ACK/ NAK	22	2	13	Enabled
AUTOCAD (after 2.5)* with .PLT file	19,200	7 bit	1	even	Direct Control	22	2	13	Enabled
CADCOM	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
CADDY	9600	7 bit	1	even	Direct Control	22	2	13	Enabled
CADKEY (prior 3.1)	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
CADKEY (after 3.1)	9600	8 bit	1	none	Xon/ Xoff	2	1	3	Disabled
CADLINC	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
CADMASTER	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
CADPLUS	9600	7 bit	1	even	Direct Control	2	1	3	Disabled
CADVANCE	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
CASCADE	9600	8 bit	1	none	Direct Control	2	1	13	Disabled

* For use with CalComp supplied Autodesk Device Interface (ADI). Available only when optional memory expansion cartridge is installed.

TABLE 3-2. PCI FORMAT PARAMETERS — Continued

Name	Baud Rate	Byte Length	Stop Bits	Parity	Hand-shake	Sync Char	Number Sync	End Message	Checksum
CAED CADD2000	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
CIVIL SOFT (Prior 11/86)	9600	8 bit	1	none	ACK/ NAK	2	2	3	Disabled
CIVIL SOFT (After 11/86)	9600	8 bit	1	none	Direct Contol	2	2	3	Disabled
DATACAD (Prior 3.0)	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
DATACAD (After 3.0)	9600	8 bit	1	none	Direct Control	2	1	3	Enabled
DIAD	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
DOGS	9600	8 bit	1	none	Xon/ Xoff	2	1	3	Enabled
EASY-DRAFT MACINTOSH	9600	8 bit	1	none	ACK/ NAK	22	2	13	Enabled
EASY-DRAFT NEC	9600	8 bit	1	none	ACK/ NAK	2	2	13	Enabled
EE DESIGNER	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
GEOCAM	9600	7 bit	1	none	ACK/ NAK	22	2	13	Disabled
IGOS	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
MACPLOT	9600	7 bit	1	even	Direct Control	85	2	13	Disabled

TABLE 3-2. PCI FORMAT PARAMETERS — Continued

Name	Baud Rate	Byte Length	Stop Bits	Parity	Hand-shake	Sync Char	Number Sync	End Message	Checksum
MCAD	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
MEDUSA	9600	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
MICRO CADAM	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
MICRO-STATION	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
MINICAD	9600	7 bit	1	even	Direct Control	2	1	3	Disabled
ORCAD	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
PALETTE	2400	8 bit	1	none	ACK/ NAK	2	1	3	Enabled
POINT LINE*	2400	8 bit	2	none	Direct Control	2	1	3	Disabled
PRIMA-VISION	9600	8 bit	1	none	Direct Control	2	1	3	Enabled
PROCAD	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
PRO DESIGN II	9600	8 bit	1	none	Direct Control	2	1	3	Disabled
CS-1	9600	8 bit	1	none	Direct Control	2	1	3	Enabled
ROAD-CALC	9600	8 bit	1	none	ACK/ NAK	2	1	3	Disabled
VERSACAD (prior to 5.3)	9600	8 bit	1	none	ACK/ NAK	126	2	13	Disabled
VERSACAD (after 5.3)	9600	8 bit	1	none	Xon/ Xoff	2	1	3	Disabled

*Requires special cable supplied by Point Line

TABLE 3-3. 960 MODE FORMAT

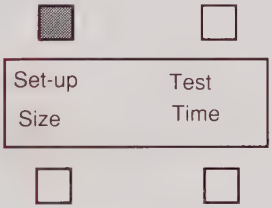
Company	Software Package	Baud Rate
ISICAD	CADVANCE	9600
Future Net	FUTURE NET	9600
Personal CAD Systems	PCAD-PCB	9600
Computervision	PERSONAL DESIGNER	9600
RACAL REDAC	REDLOG	9600

CHANGING COMMUNICATIONS PARAMETERS

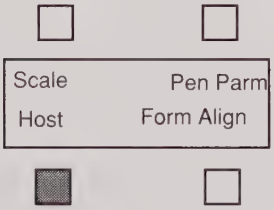
The following paragraphs contain the procedures for changing the communications parameters. Each procedure is self-contained. A save procedure is included at the end of this chapter. The soft key used to perform a given function is shown shaded. To change parameters, proceed as follows:

General Procedure

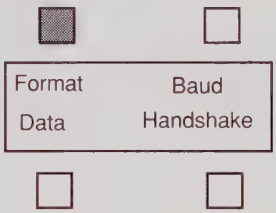
1. Power-on plotter.
2. Load media.
3. Select Manual mode.
4. Press the NEXT key until the following is displayed:



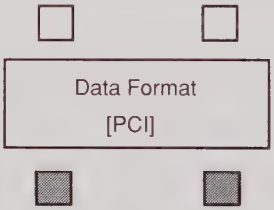
5. Press the Set-up soft key.
6. The following is displayed:



7. Press the Host soft key.
8. The following is displayed:



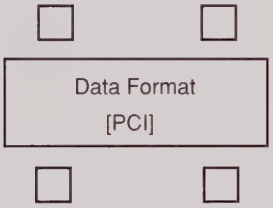
9. Press the Format soft key.
10. The following is displayed:



11. This display indicates the plotter is presently in the PCI format.
12. To change format type to CPGL or 960, press either bottom soft key until the appropriate format type is displayed.

NOTE

At this point, one of the following three displays will be seen. Locate the page number that corresponds to your format and continue with the procedure at that point.



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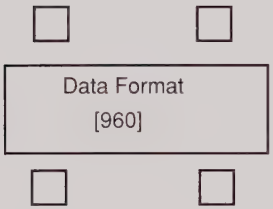
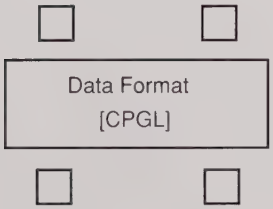


Page 3-14



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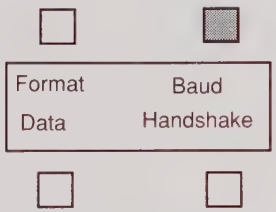
PCI Format Changes

1. Press the EXIT key.

2. The following is displayed:



Baud Rate

3. Press the Baud soft key.

4. The baud rate is displayed.

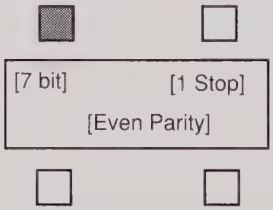
5. Pressing either bottom soft key causes the system to display each baud rate available for the PCI format.

6. When the appropriate baud rate is displayed, press the EXIT key.

Bit Length, Stop Bits, Parity

7. Press the Data soft key.

8. The following is displayed:



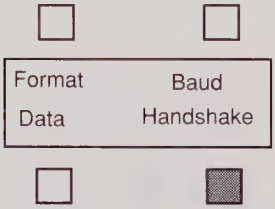
9. Press the Bit soft key. The display toggles between 7 and 8 bit length. Select the appropriate bit length.

10. Press the Stop soft key. The display toggles between 1 and 2 stop bits. Select the appropriate stop bit.

11. Press either bottom soft key. The display indicates Even Parity, Odd Parity, and No Parity. Select the appropriate parity.

12. Press the EXIT key.

13. The following is displayed:



Handshake

14. Press the Handshake soft key.

15. The following is displayed:

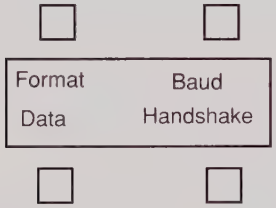
16. Press either bottom soft key. The display indicates one of the following each time a bottom soft key is pressed:

    - Dir Cntrl
    - ACK/NAK
    - Xon/Xoff

17. Select the appropriate handshake.

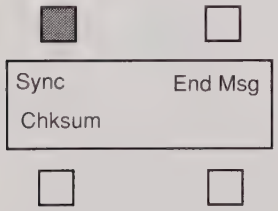
18. Press the EXIT key.

19. The following is displayed:



20. Press the NEXT key.

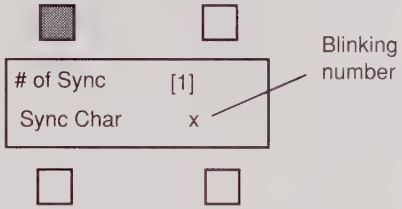
21. The following is displayed:



22. Press the Sync soft key.

Sync Character

23. The following is displayed:



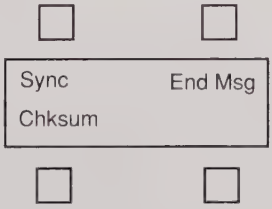
24. Using the numeric keys, enter the sync character number. It is not necessary to enter leading zeros.

Number of Sync Characters

25. Press the top right soft key to toggle the # of Sync, [x] between 1 and 2. Select the appropriate number of sync characters.

26. Press the EXIT key.

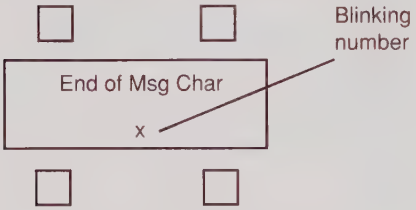
27. The following is displayed:



End of Message Character

28. Press the End Msg soft key.

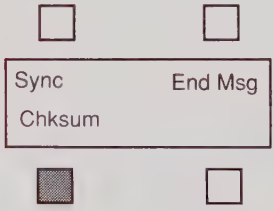
29. The following is displayed:



30. Using the numeric keys, enter the appropriate end-of-message character. It is not necessary to enter leading zeros.

31. Press the EXIT key.

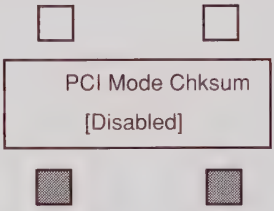
32. The following is displayed:



Checksum

33. Press the Chksum soft key.

34. The following is displayed:

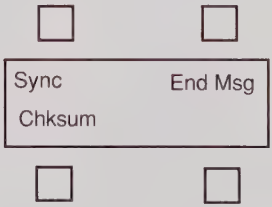


35. Press either bottom soft key to toggle between disabled and enabled.

36. Select the appropriate Checksum mode.

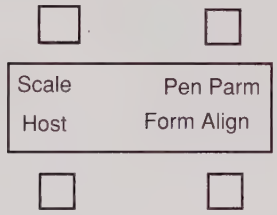
37. Press the EXIT key.

38. The following is displayed:



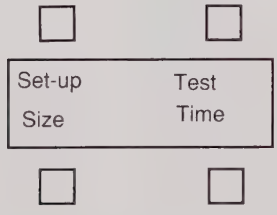
39. Press the EXIT key.

40. The following is displayed:



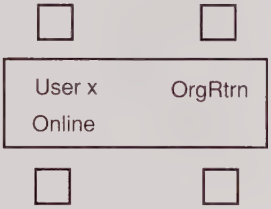
41. If changes were made, press the EXIT key and proceed to the Saving Changes procedure, (page 3-19).

42. If changes were not made, press the EXIT key. The following is displayed:



43. Press the EXIT key.

44. The following is displayed:

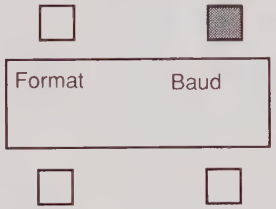


45. The plotter is now ready for operation. Proceed to Chapter 4.

960 Format Changes

1. Press the EXIT key.

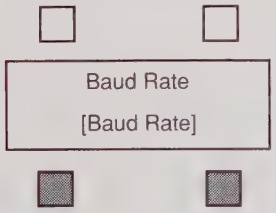
2. The following is displayed:



3. The only parameter that can be changed in the 960 format is the baud rate.

4. To change the baud rate, press the Baud soft key.

5. The following is displayed:

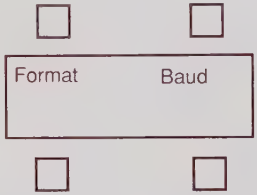


6. Pressing either bottom soft keys causes the display to indicate the available baud rates.

7. Select the appropriate baud rate.

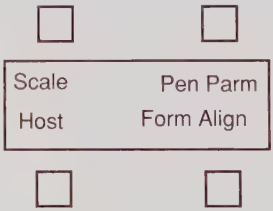
8. Press the EXIT key.

9. The following is displayed:



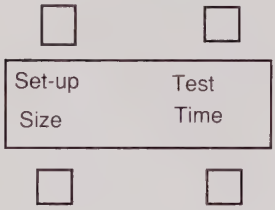
10. Press the EXIT key.

11. The following is displayed:



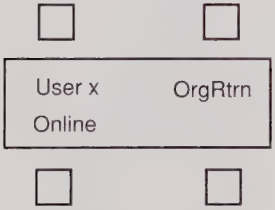
12. If changes were made, press the EXIT key and proceed to Saving Changes procedure, (page 3-19).

13. If changes were not made, press the EXIT key. The following is displayed:



14. Press the EXIT key.

15. The following is displayed:

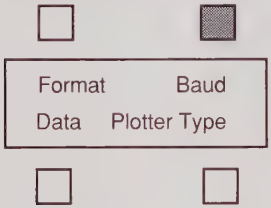


16. The plotter is now ready for operation. Proceed to Chapter 4.

CPGL Format Changes

1. Press the EXIT key.

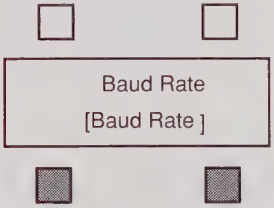
2. The following is displayed:



Baud Rate

3. Press the Baud soft key.

4. The following is displayed:

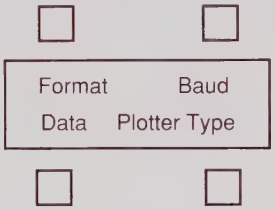


5. Pressing either bottom soft key causes the baud rate to change.

6. Select the appropriate baud rate.

7. Press the EXIT key.

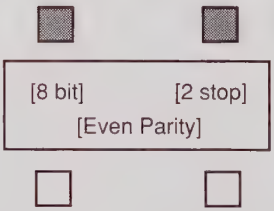
8. The following is displayed:



Byte Length, Stop Bits, Parity

9. Press the Data soft key.

10. The following is displayed:

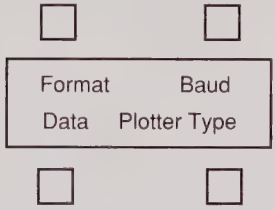


11. Press the top left soft key to change the byte length.

12. Press the top right soft key to change the stop bits.

13. Press either bottom soft key to change the parity.

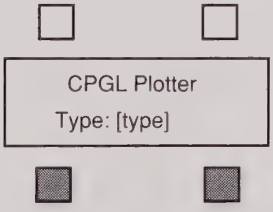
14. After the three variables are selected, press the EXIT key. The following is displayed:



Plotter Type

15. Press the Plotter Type soft key.

16. The following is displayed:

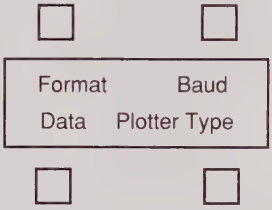


17. Pressing either bottom soft key causes the plotter type to change.

18. Select the appropriate plotter type.

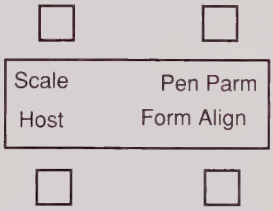
19. Press the EXIT key.

20. The following is displayed:



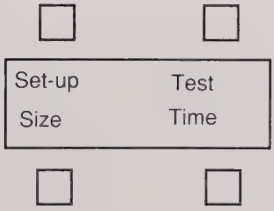
21. Press the EXIT key.

22. The following is displayed:



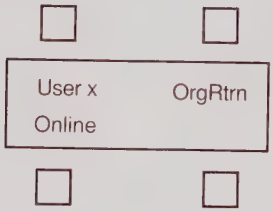
23. If changes were made, press the EXIT key and proceed to Saving Changes procedure, (page 3-19).

24. If changes were not made, press the EXIT key. The following is displayed:



25. Press the EXIT key.

26. The following is displayed:

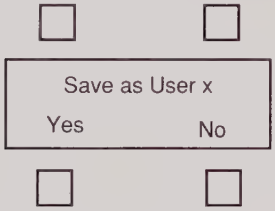


27. The plotter is now ready for operation.
    Proceed to Chapter 4.

SAVING CHANGES

Prior to performing this procedure, it is recommended that the user read the entire procedure and Figure 3-2. Figure 3-2 is a summary of the procedure.

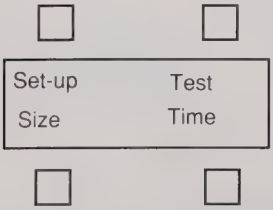
1. The following is displayed:



2. This function gives the user the option of permanently saving the changes just made, or temporarily saving the changes, or discarding them. In addition, the changes can be assigned to any one of four users (1, 2, 3, or 4).

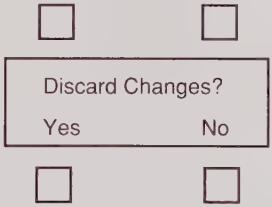
3. To assign a user number to the changes, use the numeric keys to enter user number 1, 2, 3, or 4.

4. **To permanently save the changes**, press the Yes soft key. The following is displayed:

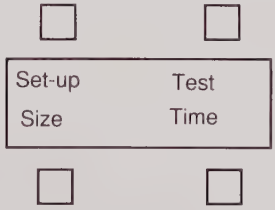


5. Proceed to step 11.

6. **To temporarily save the changes or discard them**, press the No soft key, the following is displayed:

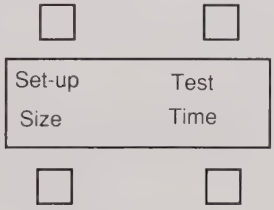


7. **If yes is pressed**, the changes are not saved and the following is displayed:



8. Proceed to step 11.

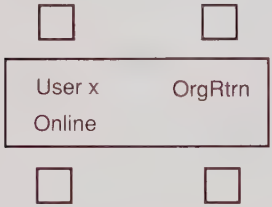
9. **If no is pressed,** the changes are temporarily saved and the following is displayed:



10. Proceed to step 11.

11. Press the EXIT key.

12. The following is displayed:



13. The plotter is now ready for operation.
    Proceed to Chapter 4.

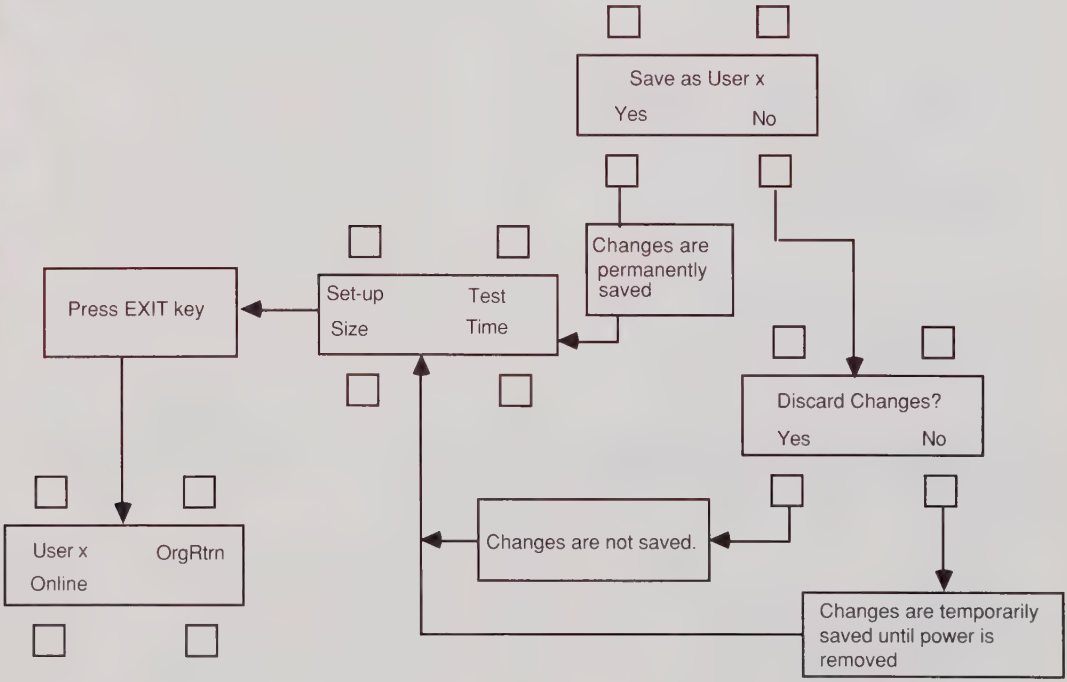
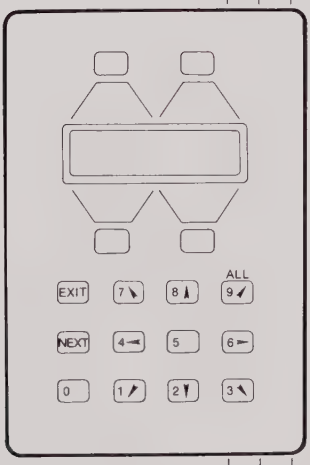


Figure 3-2. Save Procedure Summary

CHAPTER FOUR
OPERATIONS



CHAPTER 4
OPERATIONS

INTRODUCTION

This chapter describes the operation of the plotter and the use of the front panel (Figure 4-1). The plotter has two main modes of operation:

- Online
- Manual

A brief tutorial is provided to familiarize the user with both of these modes. Detailed procedures are also provided for the use of the options available within each mode.

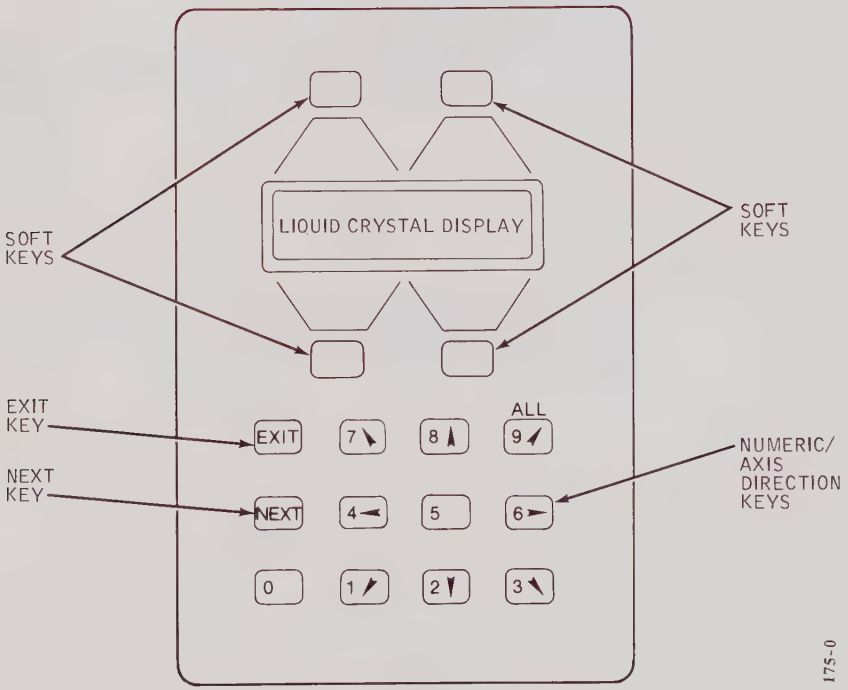


Figure 4-1. Front Panel

FRONT PANEL

The front panel (Figure 4-1) contains the following elements:

- Liquid Crystal Display (LCD)
- Four soft keys
- EXIT key
- NEXT key
- Numeric/axis direction keys

LIQUID CRYSTAL DISPLAY (LCD)

The LCD can display the following:

- Menu options
- Messages
- Prompts

The soft keys are used to select the corresponding menu options. The menu options and the soft keys form a versatile, menu-driven system.

NEXT key

The NEXT key is used to display the next page of a multipage menu.

EXIT key

The EXIT key is generally used to exit a menu or a mode of operation.

Numeric/Axis Direction Keys

These keys are multifunction keys and are used as follows:

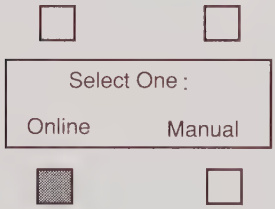
- To enter numeric values when prompted by the LCD
- To select a pen during the pen selection sequence
- To position the pen carriage or drum in the direction indicated on the key

TUTORIAL

This tutorial is intended to familiarize the user with the operation of the plotter. As stated earlier, the plotter has two main modes of operations: Online and Manual.

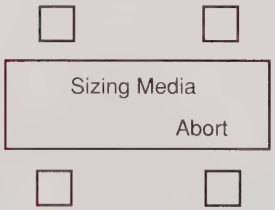
The Online mode is normally used to plot data from the host. This is the mode in which the plotter actually plots the data. However, for purposes of demonstration, it is not necessary to connect and communicate with the host. Proceed as follows:

1. Ensure that the media and pens have been loaded in accordance with Chapter 1 and that the following is displayed:

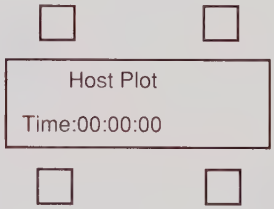


Online Mode

2. Press the Online soft key. The following is displayed as the media is sized.

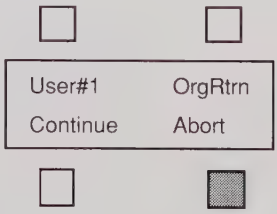


3. After the media is sized, the pen carriage obtains a pen from the pen turret and the following is displayed:



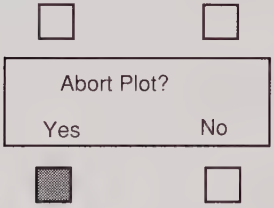
If the host had sent plot data, this display would increment (in seconds) to indicate the time the plotter was busy drawing the plot.

4. Press the EXIT key. The following is displayed:

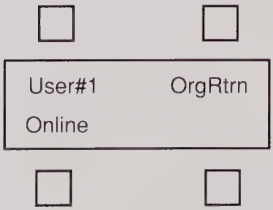


If an actual plot were being performed, this action would interrupt the plot and give control to the Manual mode

5. Press the Abort soft key. The following is displayed:



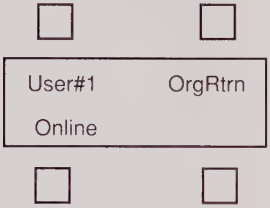
6. Press the Yes soft key. *If an actual plot were being performed, it would be aborted at this point.* The following is displayed:



7. The remainder of this procedure provides an overview of the Manual mode and a brief description of each of the options.

Manual Mode

8. The present display is the first page of the main menu.

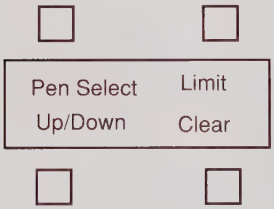


User #1 - Allows selection of set-up parameters for up to four users

OrgRtrn - Returns the pen carriage to the point where the plot started when the plotter went online

Online - Used to start a new plot

9. The main menu contains three pages of displays. To view page 2, press the NEXT key. The following is displayed:



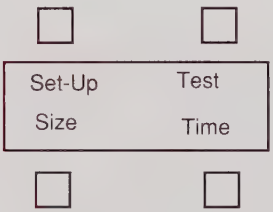
Pen Select - Allows selecting a specific pen

Limit - Allows setting the plot limits to user-defined values or to default values

Up/Down - Allows raising or lowering pen to/from media

Clear -Allows clearing the plot data buffer

10. Press the NEXT key. Page 3 of the main menu is displayed:



Set-up - Allows setting the various parameters for up to four users

Test - Allows running the confidence plot

Size - Allows viewing the dimensions of a plot

Time - Allows viewing the total time of a plot

11. Press the NEXT key. The display returns to page 1 of the main menu.

NOTE

If the EXIT key is pressed while page 2 or 3 of the main menu is displayed, control is returned to page 1.

12. Figure 4-2 shows the main menu structure.

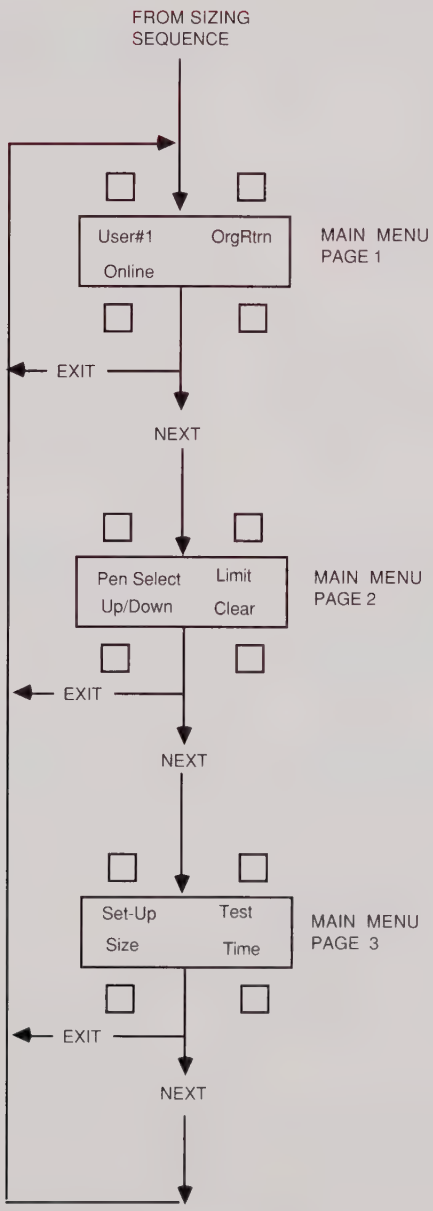


Figure 4-2. Main Menu Structure

OPERATING CONVENTIONS

The following are general operating conventions.

- The numeric/axis direction keys can be used in the Manual mode to position the pen carriage, if numeric entry is not required.

- The pen will be raised from the media after 5 seconds of non-use and after 10 additional seconds, it will be returned to the turret to prevent the pen tip from drying out.

- The pinch rollers can be raised during any operation and the operation will be terminated. However, the plotter will start again with a sizing media sequence, after the pinch rollers are lowered.

- A blinking value in a display indicates the value can be changed by using the numeric keys.

- When prompted for a numeric value, if the value entered is beyond specified limits, the value will not be accepted and a value out of range message is displayed.

- Characters enclosed in brackets indicate that characters are part of a list. The remainder of the list can be displayed by pressing the soft key closest to the character(s).

- The plotter can maintain the set-up parameters for up to four users. It is recommended that a record of user numbers and associated parameters be maintained. This allows the user to maintain different set-ups for different applications packages.

- When a numeric/axis direction key is pressed to move the pen carriage, the pen moves slowly at first. If the key is held longer, the pen moves faster.

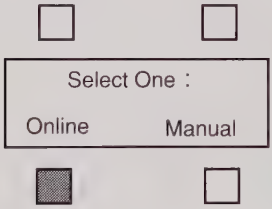
Once the user is familiar with the operation of the plotter, the menus and options will more than likely become intuitive and the following procedures will only be used for reference.

PLACING THE PLOTTER ONLINE

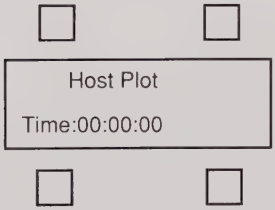
The plotter is selected for online operation prior to sizing the media or from the main menu.

Prior to Sizing Media

1. After the media is loaded, the following is displayed:



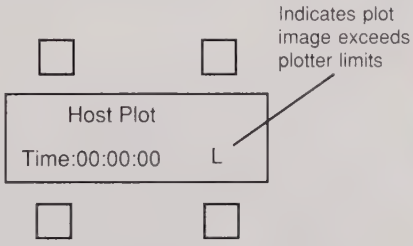
2. Pressing the Online soft key causes the media to be sized. After the media is sized, the following is displayed:



3. The plotter is now online waiting for plot data from the host. If the following has been performed properly, the host should start to send plot data and the plotter should start to draw a plot.

   - Pens and media loaded properly (Chapter 1)
   - Plotter connected to host (Chapter 2)
   - Plotter communications parameters set (Chapter 3)
   - Host applications software loaded and operating correctly

4. As the plotter draws the plot, the time displayed is incremented each second the plotter is busy.

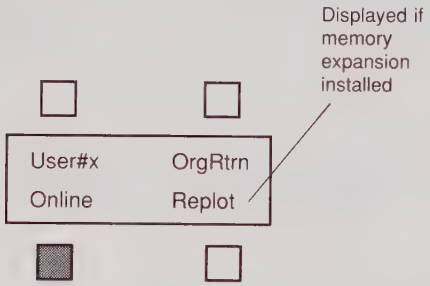


At the end of the plot, the display indicates the total time the plotter was busy.

From the Main Menu

To place the plotter online from the main menu, proceed as follows:

1. Display page 1 of the main menu.



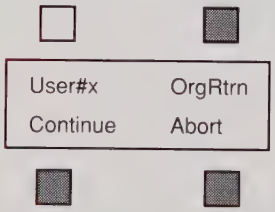
2. Press the Online soft key.

3. Continue at step 3 of the previous procedure.

Interrupting a Plot

To interrupt a plot, proceed as follows:

1. Press the EXIT key. The following is displayed:



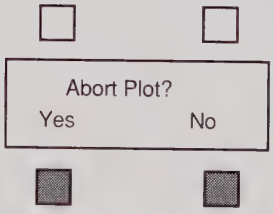
2. The host plot time is not incremented and the plotter enters the Manual mode.

3. At this point there are three options available:

   - Continue the plot (step 4)
   - Abort the plot (step 5)
   - Move the pen to the point of origin (step 7)

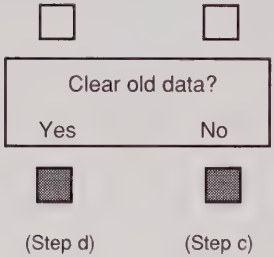
4. **To continue the plot**, press the Continue soft key. The plot continues from the point where it was interrupted. The host plot time is incremented.

5. **To abort the plot**, press the Abort soft key. The following is displayed:

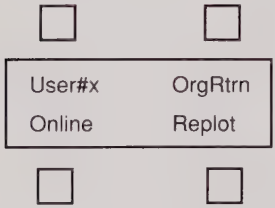


6. At this point, the user is given a chance to not abort the plot by pressing the No soft key. If the No soft key is pressed, return to step 3. If the Yes soft key is pressed the following occurs.

a. If plot data is in the data buffer, the following is displayed:

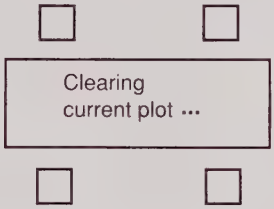


b. If plot data is not in the data buffer, control is returned to page 1 of the main menu and the following is displayed:



c. **If the No** soft key is pressed, control is returned to page 1 of the main menu and the display shown above is indicated.

d. **If the Yes** soft key is pressed, the following is displayed as the plot data is cleared.



e. Control is then returned to page 1 of the main menu shown in step b.

7. **To return to the point of origin,** press the OrgRtrn soft key. The pen carriage returns to the origin point of the plot. This point is the point where the plotter started online. This option is useful if the pen carriage has been moved using the numeric/axis direction keys and it is desired to return the pen carriage to the beginning of the plot.

MANUAL MODE

The remainder of this chapter describes the Manual mode and its various options. A procedure usually starts from one of the pages of the main menu. If you are not familiar with the main menu selection, please review the tutorial. The following options can be run from the Manual mode:

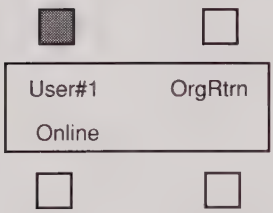
- User number
- Return to point of origin
- Online
- Replot (If memory expansion cartridge installed)
- Pen select
- Limits
- Clear
- Set-up
  - — Scale
  - — Pen parameters
  - — Host communications parameters
  - — Form alignment
  - — Plot manager
  - — Change language
  - — Change units
- Test
  - — Confidence plot
  - — IMD
  - — Percent of buffer used
  - — Revision level
- Size
- Time

USER NUMBER

This procedure should be used only if the set-up parameters have been changed and assigned to new users as described on page 4-39. The user number option is used to recall the set-up parameters (described on page 4-25) for up to four different users. Therefore, if more than one user is going to be maintained, it is highly recommended that a record of each user's parameters be maintained. To change user number, proceed as follows:

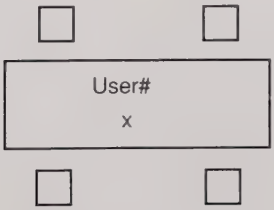
NOTE

There is no need to change user numbers if only the set-up parameters for one user are saved. These parameters may be user-defined or the factory default parameters.



1. Display page 1 of the main menu.

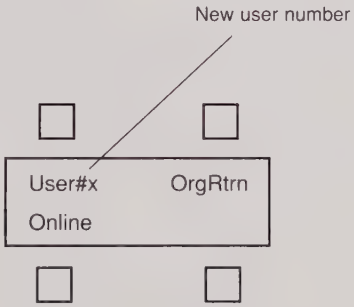
2. Press the User #1 soft key. The following is displayed:



3. Using numeric/axis direction keys, enter the appropriate user number (1 through 4).

4. Press the EXIT key.

5. The following is displayed:

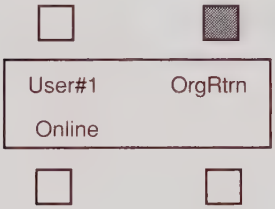


6. The plotter will now operate under the set-up parameters associated with the user number displayed.

RETURN TO POINT OF ORIGIN

This option returns the pen to the location where the plot started. By convention, the point of origin is the point at which the plotter is placed online. The default point of origin is the lower right corner of the media when the media is loaded and viewed from the front of the plotter.

1. To use this option, display page 1 of the main menu.



2. Press the OrgRtrn soft key.

3. The pen is lifted from the media and the pen returns to the point of origin. The pen remains raised.

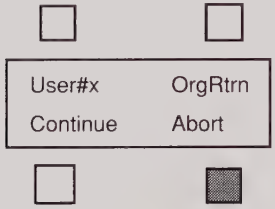
SET NEW POINT OF ORIGIN

The point of origin is defined as the point at which the plotter is placed online. This technique allows starting a plot at a new point or origin on the same media (already in the plotter) or on new media. The new point of origin can be established from the Manual mode.

New Point of Origin on Same Media

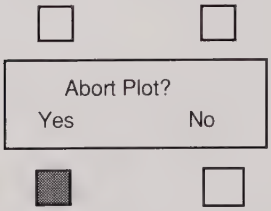
1. If the plotter is online, press the EXIT key.

2. The following is displayed:



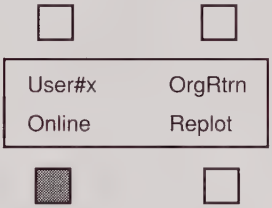
3. Press the Abort soft key.

4. The following is displayed:



5. Press the Yes soft key.

6. The following is displayed:



7. Using the numeric/axis direction keys, move the pen carriage to the new point of origin.

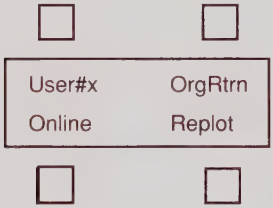
8. Press the Online soft key.

9. The plotter goes online and starts the plot at the new point of origin.

New Point of Origin on New Media

1. After the media is loaded, press the Manual soft key.

2. The following is displayed:



3. Using the numeric/axis direction keys, move the pen carriage to the new point of origin.

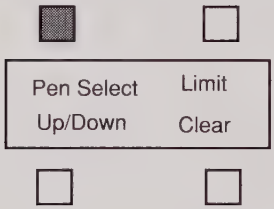
4. Press the Online soft key.

5. The plotter goes online and starts the plot at the new point of origin.

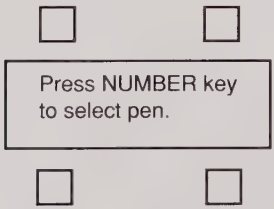
SELECTING A PEN

This option is used to select a desired pen from the pen turret. Any of eight pens may be selected. To select a pen, proceed as follows:

1. Display page 2 of the main menu.

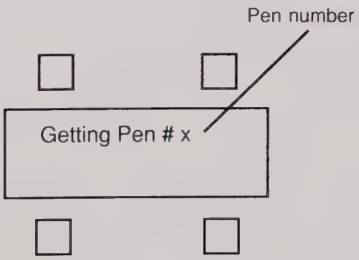


2. Press the Pen Select soft key. The following is displayed:



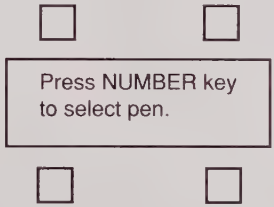
3. Using the numeric/axis direction keys, enter a pen select number (1 through 8).

4. The following is displayed:

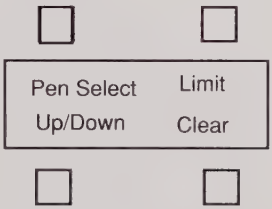


5. The pen carriage obtains the selected pen from the pen turret and returns to its previous location.

6. The following is displayed:



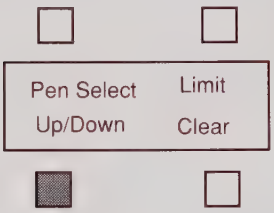
7. Press the EXIT key to display page 2.



RAISING AND LOWERING THE PEN

This option is used to raise and lower the pen from or to the media. To use this option proceed as follows:

1. Display page 2 of the main menu.

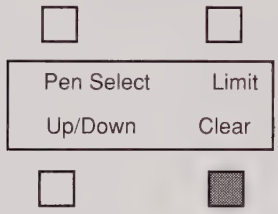


2. Press the Up/Down soft key. Each time the Up/Down soft key is pressed, the pen is raised or lowered.

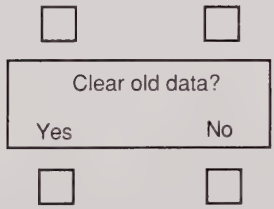
CLEARING THE PLOTTER MEMORY

This option is used to clear the current plot data in the plot buffers. The current plot data is the plot information sent from the host computer. To use this option proceed as follows:

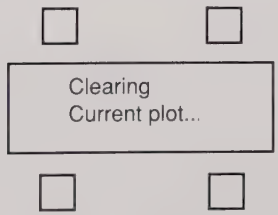
1. Display page 2 of the main menu.



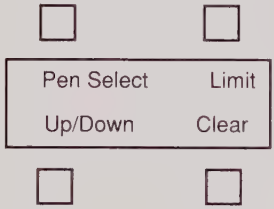
2. Press the Clear soft key. The following is displayed:



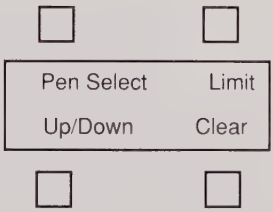
3. **Pressing the Yes** soft key causes the following to be displayed:



4. Upon clearing the plot data, the following is displayed:



5. **Pressing the No** soft key causes the following to be displayed:

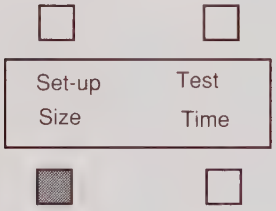


6. The plot data buffer is not cleared.

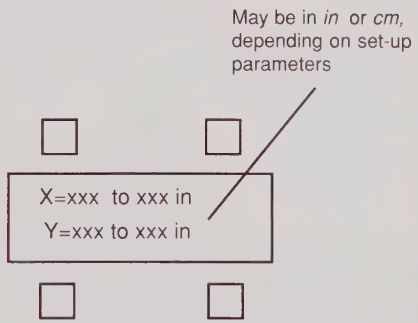
DISPLAYING THE PLOT SIZE

This option allows displaying the dimensions of a plot in progress or the dimensions of a completed plot. To use this option proceed as follows:

1. Display page 3 of the main menu.



2. Press the Size soft key. The following is displayed:



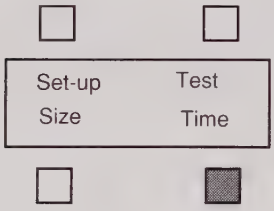
NOTE

If a plot in progress is interrupted to show the size, the dimensions shown are of the plot in progress, not the completed plot.

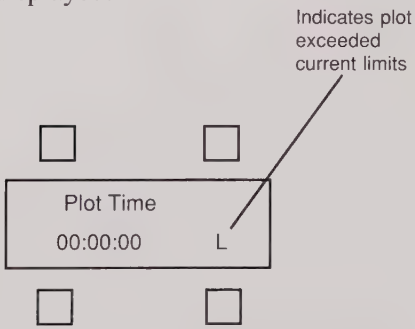
DISPLAYING PLOT TIME

This option allows displaying plot time for a plot in progress or a completed plot. The plot time is the time the plotter is busy performing the plot.
To use this option proceed as follows:

1. Display page 3 of the main menu.



2. Press the Time soft key. The following is displayed:



3. The time displayed is in hours, minutes, and seconds.

PLOT LIMITS

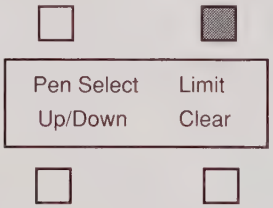
The plot limits define the limits of the plot image. The default limits are as follows: one inch from the back edge of the media and one-half inch from the other three edges (as viewed from the front of the plotter).

This option allows the following:

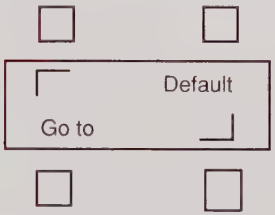
- View the existing limits
- Reset to the default limits
- Define new limits (can be used to crop a drawing)

To use this option, proceed as follows:

1. Display page 2 of the main menu.



2. Press the Limit soft key. The following is displayed:

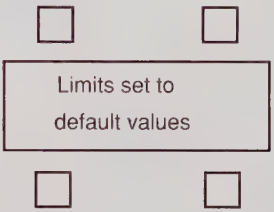


3. At this point, the following can be performed:

   - Reset to the default limits (step 4)
   - View the existing limits (step 5)
   - Define new limits (step 6)

4. **Reset to the Default Limits** - To use this option proceed as follows:

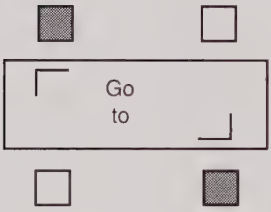
   a. Press the Default soft key. The following is momentarily displayed:



   b. The limits are now set to the default values.

5. **View The Existing Limits** - To use this option proceed as follows:

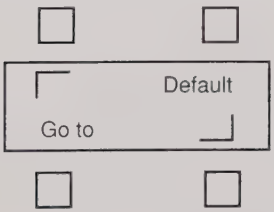
   a. Press the Go to soft key. The following is displayed:



   b. Press the ⌜ soft key to view the upper left limit. The pen carriage is moved to the upper left limit.

   c. Press the ⌟ soft key to view the lower left limit. The pen carriage is moved to the lower left limit.

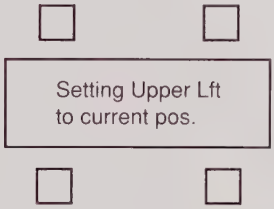
   d. Press the EXIT key. The following is displayed:



6. **Define New Limits** - To define new limits, proceed as follows:

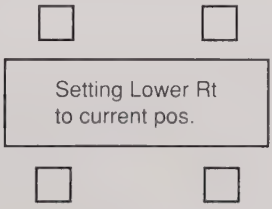
   a. Using the numeric/axis direction keys, move the pen to the location of the desired upper left limit.

   b. Press the ⌜ soft key. The following is momentarily displayed while the upper left limit is set.



   c. Using the numeric/axis direction keys, move the pen to the location of the desired lower right limit.

   d. Press the ⌟ soft key. The following is momentarily displayed while the lower right limit is set.

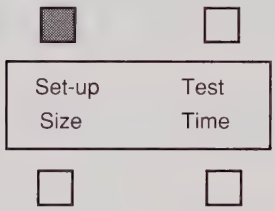


e. This operation can be used to crop a drawing by setting the limits smaller than the plot image of the drawing and then plotting the drawing again. In the next drawing, the image outside of the defined limits will not be drawn and thus, the drawing will be cropped.

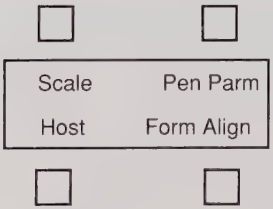
CHANGING SET-UP PARAMETERS

This option has several suboptions that are used to change the basic operating parameters of the plotter. To use this option proceed as follows:

1. Display page 3 of the main menu.



2. Press the Set-up soft key. The following is displayed:



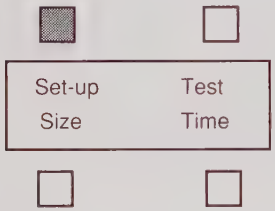
3. From this menu, the following options can be selected:

   - Scale a drawing (page 4-26)
   - Change host communications parameters (Chapter 3)
   - Change pen parameters (page 4-27)
   - Align forms (page 4-30)

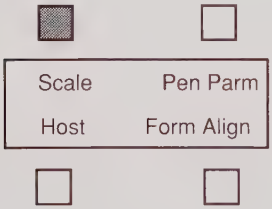
SCALING A PLOT

This option is used to change the dimensions of a plot by changing the scale factors. To use this option proceed as follows:

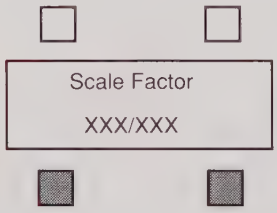
1. Display page 3 of the main menu.



2. Press the Set-up soft key. The following is displayed:



3. Press the Scale soft key. The following is displayed:

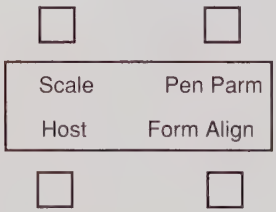


4. Pressing the lower left soft key selects the numerator field and pressing the lower right soft key selects the denominator field.

5. Use the numeric/axis direction keys to enter values for the fields.

6. For example, to scale a drawing from 22 inches wide to 11 inches wide, enter 1/2 or enter the actual dimensions (11/22). To increase a drawing from 11 inches wide to 22 inches wide, enter 2/1 or the actual dimensions (22/11).

7. After the appropriate scale factors are entered, press the EXIT key. The following is displayed:



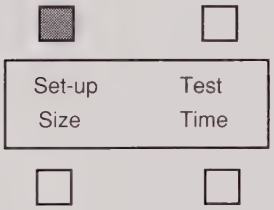
8. If changes were made, proceed to the Saving Changes procedure, (page 4-39).

CHANGING PEN PARAMETERS

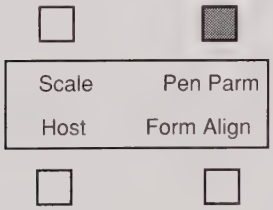
This option is used to change the pen speed and pen force for liquid ball, plastic tip and liquid ink pens. The default values are satisfactory for most plotting applications. However, operating conditions and special applications may require changing the pen parameters.

To change the pen parameters, proceed as follows:

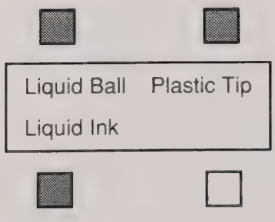
1. Display page 3 of the main menu.



2. Press the Set-up soft key. The following is displayed:



3. Press the Pen Parm soft key. The following is displayed:



4. Using the appropriate soft key, select the pen type for which the parameters are to be changed. Table 4-1 shows the default values and limits for each pen type.

5. Figure 4-3 is a generic display for the pen parameters. Using the appropriate soft key and numeric/pen movement keys, enter the pen parameter values.

6. To set the parameters the same for all pens, press the "ALL/9" key. The following is displayed:

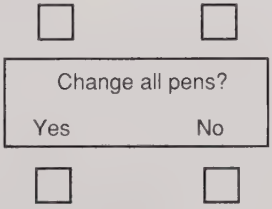


TABLE 4-1. PEN SPEED/FORCE

	Pen Speed at 45 Degrees		Pen Force		
Pen Type	Default	Max *	Default	Min	Max *
Plastic Tip WPP, WFP	6 ips 15 cm/s	10 ips 25 cm/s	03	01	05
Liquid Ball WLB	42 ips 106 cm/s	42 ips 106 cm/s	10	01	15
Liquid Ink WL, WT	8 ips 20 cm/s	10 ips 25 cm/s	02	01	05

ips = inches per second
cm/s = centimeters per second
* = recommended maximums

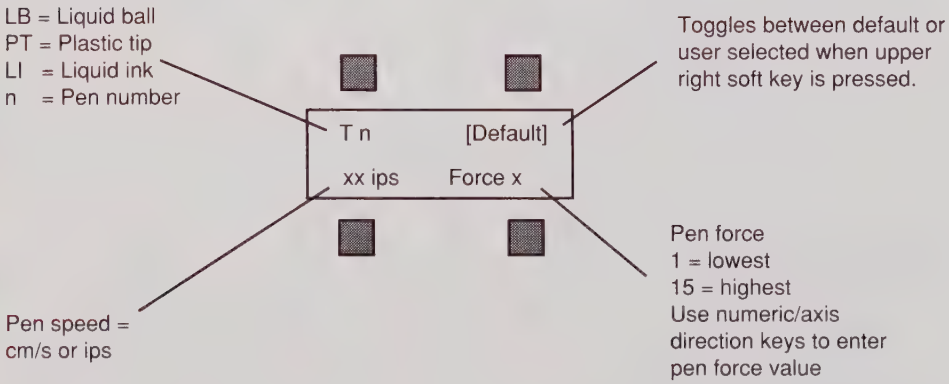

LB = Liquid ball
PT = Plastic tip
LI = Liquid ink
n = Pen number
Toggles between default or user selected when upper right soft key is pressed.
T n
[Default]
xx ips
Force x
Pen speed = cm/s or ips
Pen force
1 = lowest
15 = highest
Use numeric/axis direction keys to enter pen force value

Figure 4-3. Pen Parameter Display

7. **Pressing the No** soft key causes the operation to return to the display shown in step 5.

8. **Pressing the Yes** soft key, causes the T n field (step 5) to display "ALL." The values displayed can now be saved for all pens of the same type.

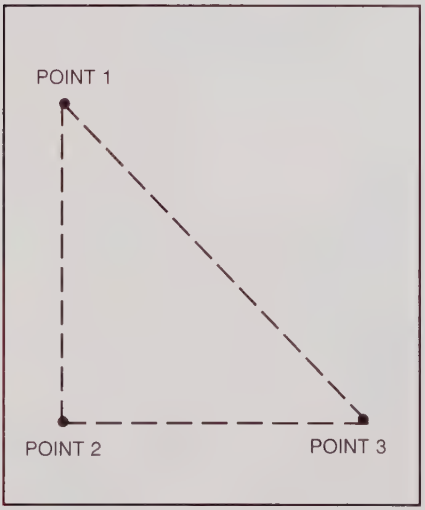
9. If changes were made to the pen parameters, proceed to the Saving Changes procedure, (page 4-39).

FORMS ALIGNMENT

This option allows the precise alignment of the plot image to gridded media and/or compensating for loaded media misalignment, when the correction is less than five degrees.

The procedure requires locating the three points of a right triangle on the media and entering the location of the points into the plotter. A sighting device called a reticle is used to locate the points. A reticle may be ordered from a CalComp Sales and Support Office listed in Appendix C. To use this option, proceed as follows:

1. If blank media is being loaded, mark the three points of a right triangle on the media prior to loading the media. These points should be as far apart as possible to increase accuracy of the alignment.

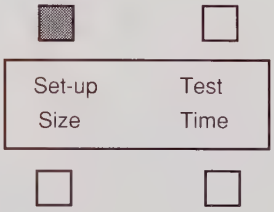


Viewed from Front of Plotter

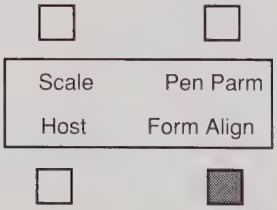
NOTE

The resulting alignment from this procedure is unique to the media loaded. The factors for this procedure are not saved for subsequent media.

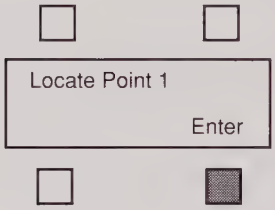
2. Display page 3 of the main menu.



3. Press the Set-up soft key. The following is displayed:



4. Press the Form Align soft key. The following is displayed:



5. Using the numeric/axis direction keys, move the pen carriage to where it is convenient to load the reticle.

6. Load the reticle into the pen carriage as shown in Figure 4-4.

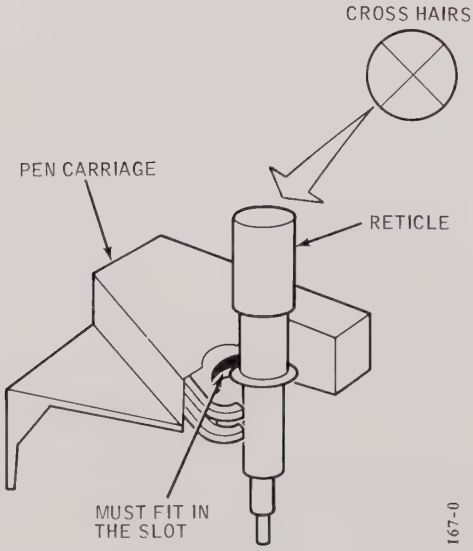
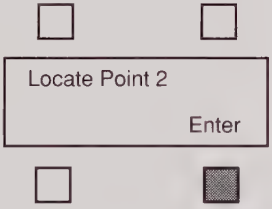


Figure 4-4. Reticle

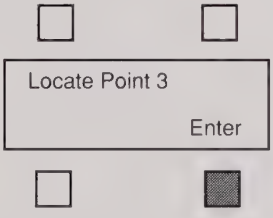
7. Sight through the reticle. Using the numeric/axis direction keys, position the cross hairs precisely over the first point of the right triangle.

8. Press the Enter soft key. The following is displayed:



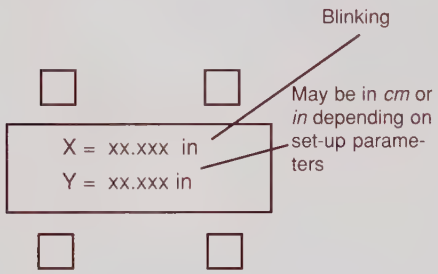
9. Sight through the reticle. Using the numeric/axis direction keys, position the cross hairs precisely over the second point of the right triangle.

10. Press the Enter soft key. The following is displayed:



11. Sight through the reticle. Using the numeric/axis direction keys, position the cross hairs precisely over the third point of the right triangle.

12. Press the Enter soft key. The following is displayed:



X = x Front-to-back axis length of the right triangle

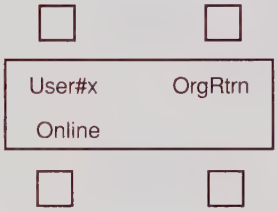
Y = y Right-to-left axis length of the right triangle

This display may be used to enter correction factors for the x and y lengths. This is only necessary when the lengths of the right triangle are known and differ from the displayed values.

To enter correction values, use the two bottom soft keys to select the Y field and the two top soft keys to select the X field. Use the numeric/axis direction keys to enter the new values.

The plot image is now aligned to the x and y axes of the right triangle.

13. Press the EXIT key three times, the following is displayed:



14. The plotter is now ready to draw the aligned plot.

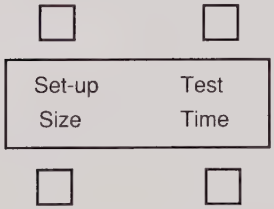
CHANGING PLOTTER UNITS

This option allows selecting either English or metric as the unit of measure to be displayed. The default is English. To use this option proceed as follows:

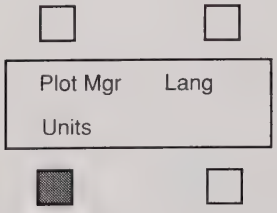
NOTE

This option affects the displayed units only and has no effect on the drawing of the plot in inches or centimeters.

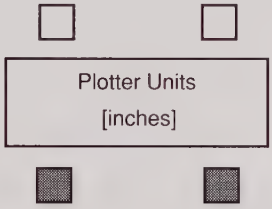
1. Display page 3 of the main menu.



2. Press the NEXT key. The following is displayed:



3. Press the Units soft key. The following is displayed:



4. Pressing either soft key causes the display to change between inches and centimeters.

5. Select the desired display units.

6. If changes were made, proceed to the Saving Changes procedure, (page 4-39).

P1/P2 POINTS FOR CPGL FORMAT

This option is only active if CPGL has been selected as the communications format (Chapter 3). Using this option allows the following:

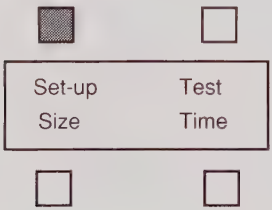
- Find the existing P1/P2 points
- Reset to the default P1/P2 points
- Set new P1/P2 points

The P1/P2 default positions are located 15 millimeters inside the default plot limits in both x and y axes. The plotter default limits are as follows:

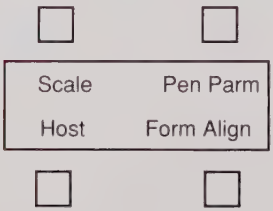
- One-half inch from the media edge on the left, right and bottom
- One inch from the edge on the top (under the pinch rollers when media is loaded)

This procedure requires the use of a sighting device called a reticle (Figure 4-4). A reticle can be ordered from a CalComp Sales and Support Office listed in Appendix C.
To use this option proceed as follows:

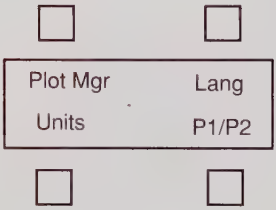
1. Display page 3 of the main menu.



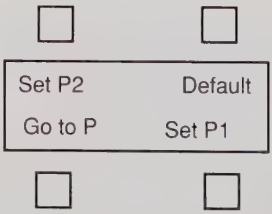
2. Press the Set-up soft key. The following is displayed:



3. Press the NEXT key. The following is displayed:



4. Press the P1/P2 soft key. The following is displayed:

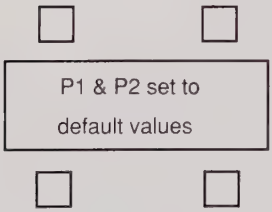


5. At this point the following can be performed:

   - Reset to default P1/P2 points (step 6)
   - Set new P1/P2 points (step 7)
   - View the existing P1/P2 points (step 8)

6. **Reset to the default P1/P2 points** - To use this option, proceed as follows:

   a. Press the Default soft key. The following is momentarily displayed:



   b. P1 & P2 have been set to the default P1/P2 values.

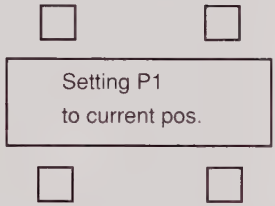
   c. Releasing the soft key causes the display to return to step 4.

7. **Set new P1/P2 points -** To use this option, proceed as follows:

   a. Load the reticle as described in the Forms Alignment procedure, (page 4-30).

   b. Using the numeric/axis direction keys, move the reticle to the new P1 point and target the P1 point.

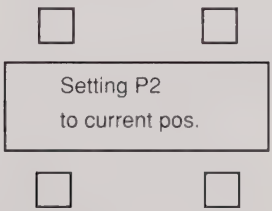
   c. Press the Set P1 soft key. The following is momentarily displayed:



   d. This sets the new P1 values. The display returns to step 4.

   e. Using the numeric/axis direction keys, move the reticle to the new P2 point and target the P2 point.

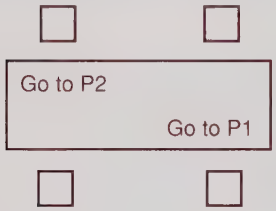
   f. Press the Set P2 soft key. The following is displayed:



   g. This sets the new P2 value. The display returns to step 4.

8. **Viewing the Existing P1/P2 Points** -
To use this option, proceed as follows:

a. Press the Go to P soft key. The following is displayed:



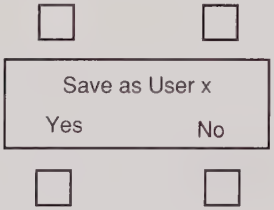
b. To view the P1 point, press the Go to P1 soft key. The pen carriage moves to the P1 point.

c. To view the P2 point, press the Go to P2 soft key. The pen carriage moves to the P2 point.

SAVING CHANGES

Prior to performing this procedure, it is recommended that the user read the entire procedure and Figure 4-5. Figure 4-5 is a summary of the procedure.

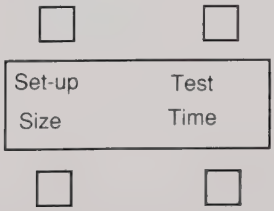
1. Press the EXIT key until the following is displayed:



2. This function gives the user the option of permanently saving the changes just made or temporarily saving the changes, or discarding them. In addition, the changes can be assigned to any one of four users (1, 2, 3, or 4).

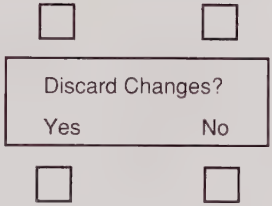
3. To assign a user number to the changes, use the numeric keys to enter the user number 1, 2, 3, or 4.

4. **To permanently save the changes**, press the Yes soft key. The following is displayed:

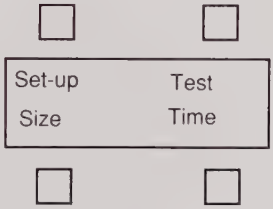


5. Proceed to step 11.

6. **To temporarily save the changes or discard the changes**, press the No soft key. The following is displayed:

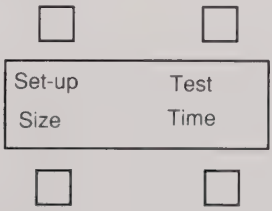


7. **If the Yes soft key is pressed,** the changes are not saved and the following is displayed:



8. Proceed to step 11.

9. **If the No soft key is pressed,** the changes are saved and the following is displayed:



10. Proceed to step 11.

11. Press the EXIT key.

12. The following is displayed:

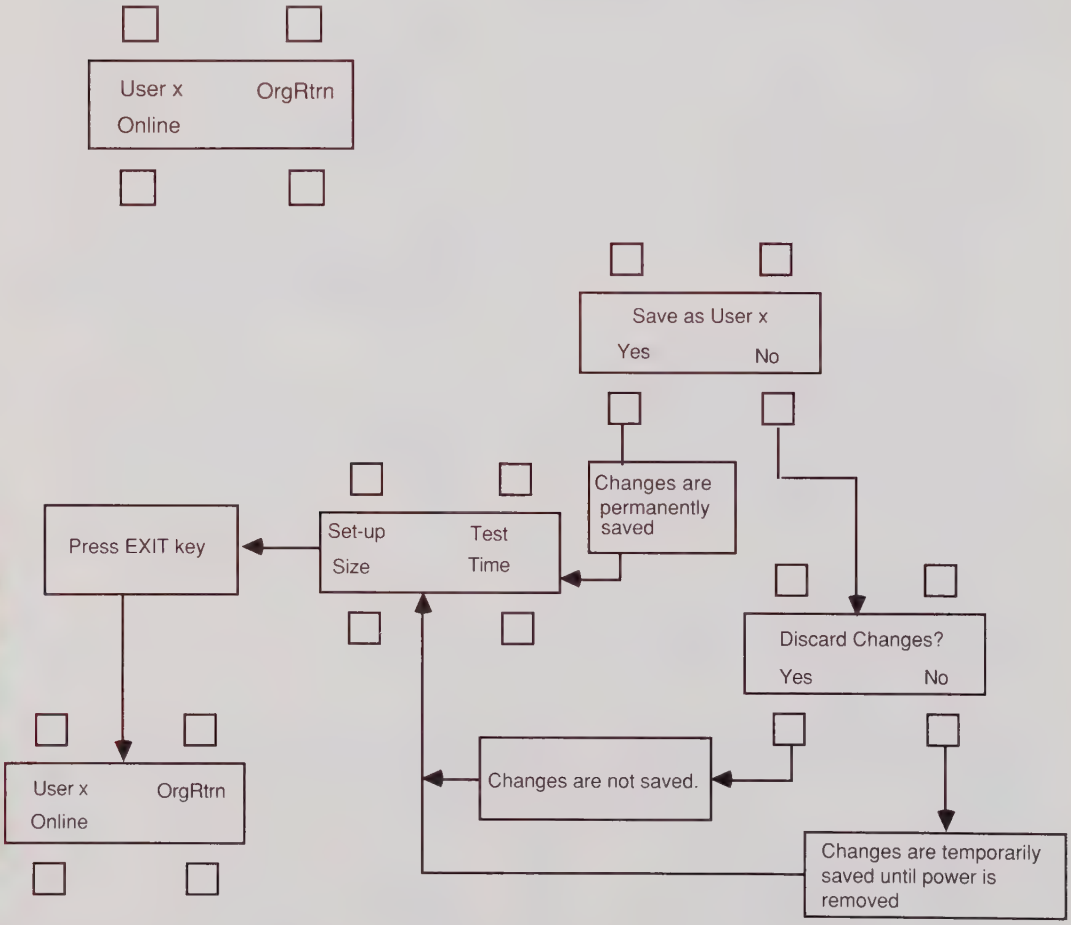


Figure 4-5. Save Procedure Summary

REPLOTTING A DRAWING

This feature operates only if a memory expansion cartridge has been installed (Chapter 1). The memory expansion cartridge allows the replotting of plot data previously sent to the plotter. That is, the host does not have to retransmit the data. A memory expansion cartridge may be ordered from the CalComp Sales and Support Office listed in Appendix C.

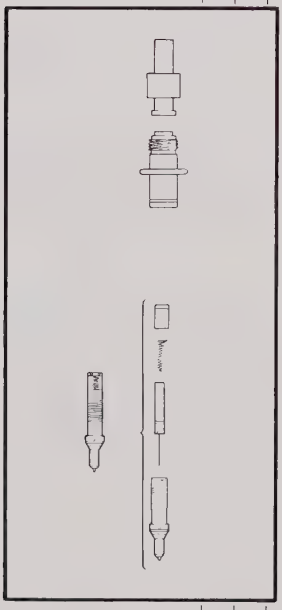
NOTE

This procedure is abbreviated, as it is intended for a user familiar with the operation of the plotter.

To use this feature, proceed as follows:

1. Ensure that the memory expansion cartridge has been installed properly (Chapter 1).
2. Place the plotter online and draw an initial plot.
3. EXIT to Manual mode. At this point, a drawing can be replotted on existing media or new media. To replot a drawing on currently loaded media, proceed to the next step. To replot a drawing on new media, proceed to step 7.
4. **To replot a drawing on currently loaded media**, reposition the pen carriage to the new point of origin.
5. Abort the existing plot.
6. Press replot. The plotter replots the drawing on the new area of the media.
7. **To replot a drawing on new media**.
8. Load the new media.
9. Select the Manual mode.
10. Select Replot.
11. The plotter redraws the plot on the new media.

CHAPTER FIVE
PENS AND MEDIA



CHAPTER 5
PENS AND MEDIA

INTRODUCTION

This chapter describes the pens and media recommended specifically for use with the Artisan plotter. Included are tables providing the following information:

- Pen types and characteristics
- Media types and characteristics
- Media cut-sheet standards
- Pen/media combinations for specific applications
- Recommended pen speed/force for a given pen type

In addition, a procedure is provided at the end of this chapter for changing the turret pen caps.

CalComp plotter pens and media are designed to provide optimal pen life, plot quality, and plotter performance. For a complete listing of plotter supplies, refer to the following literature:

- CalComp Guide to Liquid Inking
  Part No. 10300-901-001-2, Order No. M0012-240

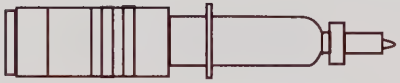
- CalComp Pen Plotter Supplies Catalog
  (packed with the plotter), Order No. G0266-SUP

PEN TYPES

Table 5-1 lists Artisan pen types, line widths, and associated characteristics. The plotter uses the following pen types:

- Disposable liquid ball-**WLB** series
- Disposable plastic tip-**WPP**, **WFP** series
- Disposable liquid ink-**WL**, **WT** series
- Refillable (reusable) liquid ink-**7L**, **7T** series

WLB-DISPOSABLE LIQUID BALL



PLASTIC TIP PENS
WPP-MEDIUM TIP
WFP-BROAD TIP

WL-DISPOSABLE LIQUID INK

WT-DISPOSABLE LIQUID INK

7T, 7L REFILLABLE LIQUID INK

The maintenance of the refillable liquid ink pen is described in Chapter 6 - Preventive Maintenance and Troubleshooting.

TABLE 5-1. PEN TYPES

Type	Line Width *			Characteristics
	Size	in	mm	
Liquid Ball WLB	Medium	0.012	0.30	1. Disposable 2. Inexpensive 3. Dense line 4. Good reproduction quality
Plactic Tip WPP	Medium	0.012	0.30	1. Disposable 2. Medium lines 3. Vivid colors 4. Excellent business graphics
Plastic Tip WFP	Broad	0.025	0.64	1. Disposable 2. Broad lines 3. Vivid colors 4. Excellent business graphics
Liquid Ink WL	Ex Fine Fine Medium Broad	0.010 0.014 0.020 0.028	0.25 0.35 0.50 0.70	1. Disposable 2. No maintenance 3. Inexpensive 4. For paper/vellum only
Liquid Ink WT	Ex Fine Fine Medium Broad	0.010 0.014 0.020 0.028	0.25 0.35 0.50 0.70	1. Disposable 2. No maintenance 3. Inexpensive 4. For polyester film only
Liquid Ink 7L series (stainless steel)	Ex Ex Fine Ex Fine Fine Medium Med. Broad Broad	0.010 0.011 0.015 0.018 0.022 0.027	0.25 0.28 0.38 0.46 0.56 0.69	1. Reusable 2. General plotting 3. Excellent blueline/photoreproduction 4. Long life
Liquid Ink 7T series (Tungsten)	Ex Ex Fine Ex Fine Fine Medium Med. Broad Broad	0.010 0.011 0.015 0.018 0.022 0.027	0.25 0.28 0.38 0.46 0.56 0.69	1. Reusable 2. General plotting 3. Excellent blueline/photoreproduction 4. Long life

* approximate

MEDIA TYPES

Table 5-2 lists Artisan media types and associated charcteristics; Table 5-3 lists the cut-sheet standards. The following media types can be used:

- Translucent
- 22-pound bond
- Vellum 1411
- Polyester film (double matte)
- Gloss
- ClearPlot©

TABLE 5-2. MEDIA TYPES

Type	Description
Translucent	Often called lightweight 15-pound bond, both economical and easy to use. Because of its translucency, this paper is suitable for good blueline reproduction.
22-Pound Bond	An economical paper for preliminary drawings and checkplots. Because of its opaqueness and high contrast, it is excellent for photoreproductions.
Vellum 1411	Resin impregnated, designed to have the best combination of stability, translucency, and ink acceptance. Provides excellent blueline reproductions.
Polyester Film 3D DM (3 mil)	Double matte for plotting on either side. Possesses very high dimensional stability regardless of changes in temperature and humidity. This film is recommended for close tolerance high-accuracy applications, such as overlays and master archival copies. It has excellent translucency and does not tear, crack, peel, or fade under normal use.
Gloss	Coated paper having excellent smoothness and high specular reflectance for bold and vivid colors for presentation graphics.
ClearPlot©	A transparent plastic material used for creating business graphics transparencies. It is available only from CalComp.

TABLE 5-3. CUT-SHEET STANDARDS

ANSI	**Size**	**A**	**B**	**C**	**D**	**E**
	Inches	8.5x11	11x17	17x22	22x34	34x44
	Millimeters	216x279	279x432	432x559	559x864	864x1118
ISO	**Size**	**A4**	**A3**	**A2**	**A1**	**A0**
	Inches	8.27x11.69	11.69x16.54	16.54x23.35	23.35x33.1	33.11x46.81
	Millimeters	210x297	297x420	420x594	594x841	841x1189
ARCH	**Size**	**1**	**2**	**3**	**4**	**5**
	Inches	9x12	12x18	18x24	24x36	36x48
	Millimeters	229x305	305x457	457x610	610x914	914x1219

ANSI = American National Standards Institute for Engineering Drawings
ISO = International Standards Organization for Engineering Drawings
ARCH = Architectural Standards

PENS/MEDIA COMBINATIONS

Table 5-4 lists the pen/media combinations for specific applications. The applications are listed at the top of the table and the pens/media are listed at the left side of the table. Recommended pen/media combinations are indicated by an "x." For specific details on pens and media, refer to Tables 5-1 or 5-2.

TABLE 5-4. PENS /MEDIA COMBINATIONS

Application / Pen/Media	Checkplots final plots, good reproduction quality	Final graphics, overhead transparencies, notebook insertions	Business graphics, pie charts, borders	Final drawings, paper/vellum	Final drawings, polyester film	Blueline or photo-reproduction paper/vellum	Blueline or photo-reproduction polyester film
WLB (Liquid ink)	X						
WPP (Plastic tip)		X	X				
WFP (Plastic tip)		X	X				
WL (Liquid ink, disposable)				X		X	
WT (Liquid ink, disposable)				X	X	X	X
7L (Stainless steel)				X		X	
7T (Tungsten)				X	X	X	X
Translucent	X					X	
Gloss		X	X				
22-pound bond	X						
Vellum 1411				X		X	
Polyester film					X		X
ClearPlot©		X	X				

PEN SPEED/FORCE

Table 5-5 lists the pen speed and pen force parameters for each pen type. The default parameters are listed with the recommended minimum and maximum limits. To draw the highest quality plot, set the pen speed at the lower end of the range. To draw many plots of lesser quality, set the pen speed to the higher end of the range. To change speed and force parameters, refer to Chapter 4, Operations.

TABLE 5-5. PEN SPEED/FORCE

	Pen Speed at 45 Degrees		Pen Force		
Pen Type	**Default**	**Max ***	**Default**	**Min**	**Max ***
Plastic Tip WPP, WFP	6 ips 15 cm/s	10 ips 25 cm/s	03	01	05
Liquid Ball WLB	42 ips 106 cm/s	42 ips 106 cm/s	10	01	15
Liquid Ink WL, WT 7L, 7T	8 ips 20 cm/s	10 ips 25 cm/s	02	01	05

* – recommended maximums
ips – inches per second
cm/s – centimeters per second

TURRET PEN CAPS

The plotter is shipped with eight pen caps installed in the pen turret. The pen caps prevent the ink in the pens from drying out or evaporating when the plotter is not in use. There are two types of pen caps; each type of cap is identified by its color:

Beige - for plastic and liquid ball pens
Black - for liquid ink pens

If liquid ink pens are to be loaded into the turret, they must have the black pen caps installed to operate properly. Black pen caps are included with the accessories kit.

To load the pen caps or change pen caps, proceed as follows:

1. Refer to Figure 5-1.
2. If necessary, remove existing pen caps from pen cap holder.
3. Install a new pen cap by squeezing the cap between thumb and forefinger.
4. Slide the cap into opening in the pen cap holder.
5. Ensure the cap holder brackets fit snugly into the pen cap grove.

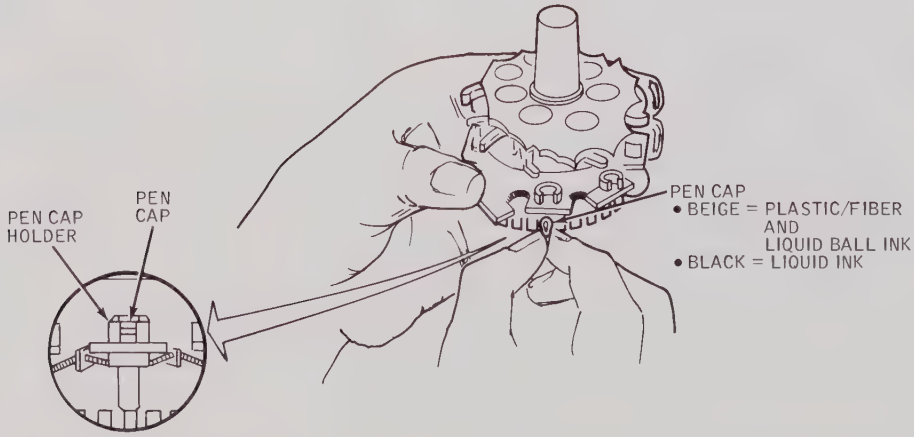
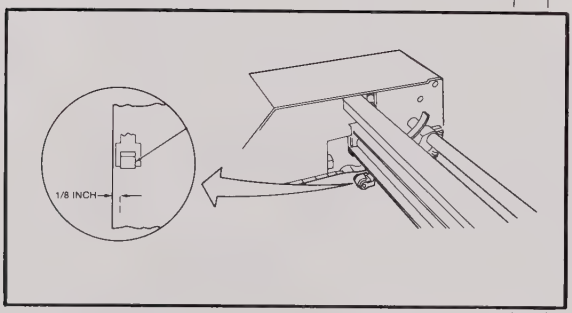


Figure 5-1. Turret Pen Caps

CHAPTER SIX
MAINTENANCE



CHAPTER 6
MAINTENANCE

INTRODUCTION

This chapter includes procedures for cleaning the plotter and procedures for the care and handling of refillable liquid in pens.

CLEANING THE PLOTTER

Plotter maintenance is limited to a thorough cleaning. All other maintenance must be performed by qualified service personnel. Periodically clean the plotter as follows:

1. Wipe the plotter surface with a lint-free cloth dampened very lightly with warm water. Do not use abrasive cleaners, cleaning solvents or strong detergents. They can damage the surface of the plotter and its moving parts.

2. Wipe dust and dirt from the cover.

3. Using the stiff bristle brush supplied with the plotter, remove paper chad and residue from the grit drum.

4. Use a lightly moistened cloth to clean the platen and pinch rollers.

5. Remove the pen caps from the turret and clean them with a cotton swab and water; replace any worn or cracked pen caps.

MAINTENANCE OF REFILLABLE LIQUID INK PENS

This subsection provides information on the care and handling of refillable liquid ink pens. Careful cleaning, storing, and filling of the pens are important factors in creating good drawings.

General Procedures

- **Pen Caps** - Built-up ink and paper dust in the pen caps can affect the plot quality. Pen caps should be inspected periodically and cleaned or replaced as necessary.

- **Pen Tips** - Pen tips should be inspected periodically during use and if necessary cleaned with a lint-free cloth moistened in warm water.

- **Storage** - Store all refillable liquid ink pens in the supply kit or a container that is protected against moisture or extreme temperature. Liquid ink pens can be left in the turret for a maximum of 24 hours.

NOTE

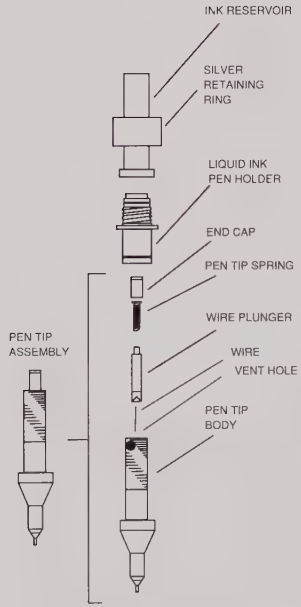
If the pens are left in the turret beyond 24 hours, the pens must be disassembled and cleaned.

Assembling a Liquid Ink Pen for Use

Before assembling a liquid ink pen, always ensure that the parts are clean, especially the inside of the pen tip.

NOTE

The ink on the tip of the pen dries quickly if the pen is not used and left uncapped.



1. Select the appropriate pen tip assembly.
2. Shake the pen tip assembly vigorously to check the freedom of movement of the wire plunger.
3. Screw the pen tip assembly into the pen holder, but do not tighten.
4. Place the concentricity wrench over the pen tip and tighten the tip, finger tight only.
5. Select the appropriate ink reservoir.
6. Determine the color of the liquid ink to be used.
7. Pour the ink into the ink reservoir.
8. While still holding the ink reservoir upside down, press the pen holder into the reservoir and tighten the silver retaining ring.

NOTE

Ensure that the silver retaining ring is not smudged or scratched. The plotter senses this ring to set optimum parameters for liquid ink plotting.

9. To start ink flow to pen tip, shake assembly downward several times.

   The motion should be as if you were throwing a dart. Be sure and point away from yourself and others (towards a piece of paper).

10. Prime the pen manually by writing on a piece of plotting material. If ink does not flow, repeat step 9.

Cleaning the Entire Pen

1. Refer to the figure and proceed as follows:

2. Loosen the silver retaining ring and disconnect the ink reservoir from the pen holder.

CAUTION

Do not clean the silver retaining ring in a ultrasonic cleaner. The cleaner may damage the retaining ring.

3. Clean the silver retaining ring in cold tap water and wipe dry with a lint-free cotton cloth.

4. Unscrew the pen tip assembly from the pen holder.

5. Rinse the pen holder and ink reservoir in warm water to remove all traces of ink. Pay special attention to the internal threads of the pen holder. Dried ink can flake off when a tip is inserted and cause a blockage.

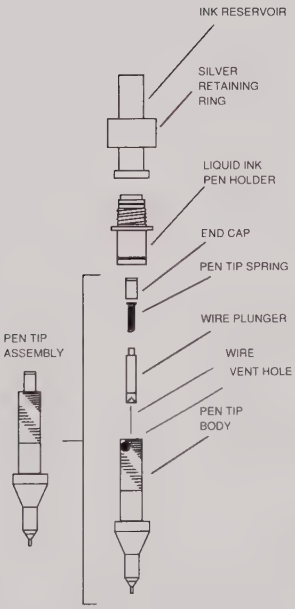
6. Remove the end cap from the pen tip body by pulling on the end cap.

7. Clean the pen tip body.

CAUTION

Do not force the wire plunger from the pen tip body. If the wire plunger does not slide easily, immerse the whole assembly in pen cleaner until the wire plunger is free.

If more than one pen tip assembly is being cleaned, do not intermix the parts, even if the pen points are the same size.



6. Place the end cap, pen tip spring, wire plunger, and pen tip body in a cleaning basket (supplied with the pen accessory kit).

7. Place the basket in the ultrasonic cleaner or in a jar of pen cleaner. Ultrasonic Cleaner, Part No. 5005–202–000, is available from CalComp.

8. Ensure that all traces of ink are removed from the parts and vent hole.

9. Remove the cleaning basket from the pen cleaner and rinse the parts in warm flowing water.

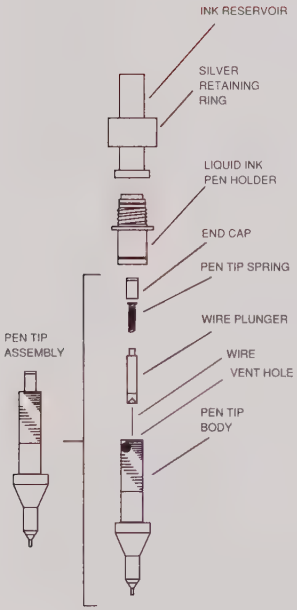
10. Blow dry all parts.

CAUTION

Do not leave the pen assembly parts in an ultrasonic cleaning solution for more than 24 hours.

11. Inspect the parts for any damage, such as bent wire plunger or a worn pen tip. It is very useful to have a CalComp pen tip microscope (IC No. 536250-4) for this purpose.

12. If the pen tip is worn or bent, replace the pen tip assembly.



13. Assemble the parts of the pen tip assembly as follows:

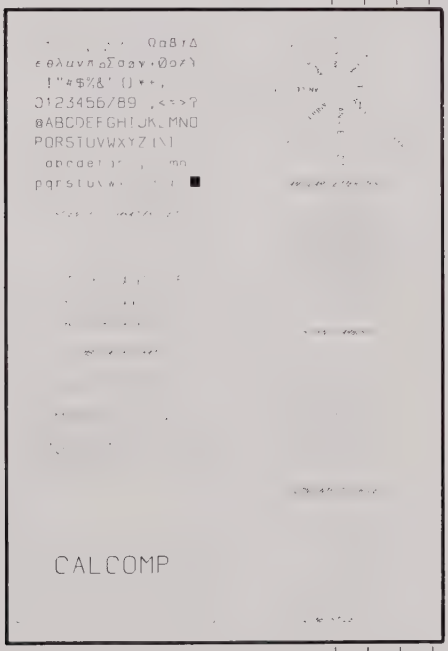
    a. Insert the wire plunger in the pen tip body, but do not force it. The wire plunger slides into position under its own weight.

    b. Insert the large end of the pen tip spring in the end cap.

    c. Press the pen tip body and the end cap together.

    d. Connect the ink reservoir and pen holder loosely (until ready for use) by partially engaging the silver retaining ring.

CHAPTER SEVEN
PROBLEM SOLVING



CHAPTER 7
PROBLEM SOLVING

INTRODUCTION

This chapter serves as a guide to help correct some of the most common day-to-day problems. The chapter is divided into the following areas:

- Non-operational problems
- Operational problems
- Plot quality problems
- Supplies problems
- Host communications problems
- Firmware error indications
- Diagnostic information

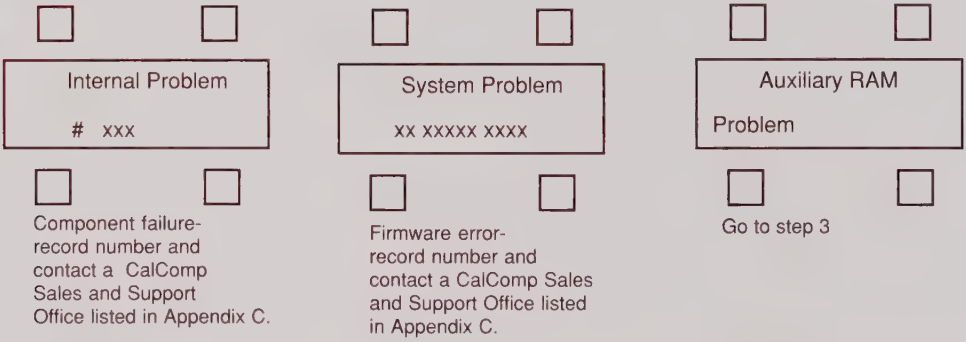
NON-OPERATIONAL PROBLEMS

Plotter Will Not Operate

1. Does the plotter turn on?

   Yes- Go to step 2.
   No - Go to step 4.

2. Are any of the following error messages displayed?


Internal Problem
xxx
Component failure- record number and contact a CalComp Sales and Support Office listed in Appendix C.
System Problem
xx xxxxx xxxx
Firmware error- record number and contact a CalComp Sales and Support Office listed in Appendix C.
Auxiliary RAM
Problem
Go to step 3

   Yes - Ensure the voltage select switch is set properly. If problem persists, perform procedure specified.
   No - Contact a Calcomp Sales and Support Office listed in Appendix C.

3. Power-down the plotter. Remove the memory expansion cartridge and power-up. Does problem persist?

   Yes - Contact a CalComp Service Representative.
   No - Memory expansion cartridge is bad. Contact a CalComp Sales and Support Office listed in Appendix C.

4. Check the following items:

   - Voltage select switch set for wall outlet voltage level
   - Power cord properly plugged into plotter and wall outlet
   - Determine if wall outlet voltage is proper level

If the plotter still does not turn on, contact a CalComp Sales and Support Office listed in Appendix C.

OPERATIONAL PROBLEMS

These are problems that can occur as a result of operation and are usually caused by some mechanical problem or failure of some operation. The error message is presented first, followed by a recommended action. If the recommended action does not clear the problem, contact a CalComp Sales and Support Office listed in Appendix C.

Check turret Press any key

The plotter cannot pick up or replace a pen from the turret. The turret may be jammed. Remove the turret and check for obstructions.

Install turret Press any key

The turret has been removed or has moved out of position. Reinstall the turret. Ensure it is properly installed.

Remove a pen Press any key

There are too many pens in the plotter. The plotter senses a pen in the pen carriage and eight pens in the turret.

Install a pen Press any key	The plotter does not sense a pen in the pen carriage or the turret. Remove the turret and install at least one pen. Replace the turret.
Please check media size	During the media load sequence, the plotter sensed the media was not within the size limits. Remove the media and verify that it is within the size range specified for the plotter. Replace media and restart the media load sequence.
Please lower cover	Indicates cover was raised after plotter was placed online or during replot or confidence plot. Lower cover and press the Continue soft key.
Please check carriage Reset	Indicates obstruction to carriage or drum, or a plotter malfunction. Remove the obstruction and press the Reset soft key to continue.
Please check Drum Reset	

PLOT QUALITY PROBLEMS

Use this section if the line quality of the plots is not satisfactory.

1. Are the correct pens and media being used as recommended in Chapter 5?

   No - Use correct pens and media combinations

   Yes - Go to step 2.

2. Is paper movement restricted?

   No - Go to step 3.

   Yes - Move the plotter to an open area where paper movement is not obstructed. Run the plot again. If the problem persists, go to step 3.

3. Are lines of uneven quality?

   No - Go to step 4.

   Yes - Remove the turret and examine the pens. Replace any damaged or dried-out pens. Run the plot again. If the problem persists, go to step 4.

4. Are lines drawn with uneven widths or are they smeared?

   No - Go to step 5.

   Yes - Reducing pen speed can improve line quality. Perform pen parameter set-up in accordance with Chapter 4. Run the plot again. If the problem persists, go to step 5.

5. Does the ink flake off the media?

   No - Go to step 6.

   Yes - If the media has been treated with a cleaning powder or other compound, the ink may be adhering to this powder. Load new media and run the plot again.

6. Are you using CalComp supplied media and pens?

   No - CalComp media and pens are designed to work with the plotter to produce sharp, clear lines.

   Yes - If the plot quality is still not satisfactory, refer to Chapter 5 and ensure that the correct pens and media are being used for the application being performed.

SUPPLIES PROBLEMS

Use this section if pens are not lasting as long as you would expect, or if media tears during plotting.

Pens Dry in the Turret

Before proceeding with this procedure, it is important to note that in dry climates, ink dries more rapidly than in humid climates. In dry climates, more care must be taken to cap pens.

1. Are pens capped after use?

   No - Pens that remain in the turret over long periods of time tend to dry out. Remove plastic tip pens from the turret and replace the caps if the pen and caps are not going to be used for several days. Remove liquid ink pens and cap them if they are not going to be used in the next 12 hours.

   Yes - Go to step 2.

2. Remove the turret and examine the rubber pen caps. Are any of the pen caps damaged, worn or loose?

   No - Go to step 3.

   Yes - Press loose pen caps into place. If any pen caps are damaged or missing, replace them with new caps.

3. Are refillable liquid ink pens being used?

   No - Ensure stored pens have not exceeded their shelf life.

   Yes - Refer to Chapter 6 and follow maintenance instructions carefully.

Media Tears During Plotting

1. Is a recommended pen and media combination being used?

   No - Refer to Chapter 5, Pens and Media

   Yes- Go to step 2.

2. Are the edges of the media curled?

   No - Go to step 3.

   Yes - Load the media with curled edges down. Run the plot again.

3. Remove the turret and examine the pens. Are pen tips damaged or assembled incorrectly?

   No - Go to step 4.

   Yes - Replace any damaged pens and/or assemble pens correctly.

4. Is the plot drawn with many closely spaced lines?

   No - Ensure high-quality media is being used.

   Yes - Use a stronger plotting media and/or change pen parameters to allow ink time to dry before additional lines are drawn.

HOST COMMUNICATIONS PROBLEMS

Host data overrun error RESET

Host data parity error RESET

Data framing error RESET

Bad host command error RESET

Input buffer overflow RESET

1. Are any of the messages in the left column displayed?

   Yes - Press the RESET soft key. Go to step 2.
   No - Go to step 3.

2. Does the problem persist?

   Yes - Check the host communications set-up parameters in Chapter 3 and reconfigure the parameters if necessary.

   No - May be an intermittent problem.

3. Possible bad RS-232C cable or connection between plotter and host computer. Check cable and connections. Does the problem persist?

   No - Possible bad cable or connection.
   Yes - Go to step 4.

4. Disconnect the RS-232C cable connection between the plotter and the host computer, and run the plotter confidence plot. Is the confidence plot OK?

   Yes - The plotter is OK. Check out the host computer and the applications software.

   No - The plotter has a problem. Contact a CalComp Sales and Support Office listed in Appendix C.

FIRMWARE ERRORS

The displays in the left column are Electrically Erasable Read-Only Memory (EEROM) Warnings.

Bad EEOM data
Re-initializing

Any of the these messages cause the EEROM to be initialized. If this occurs, all set-up parameters are reset to the factory defaults. Any changes that were made to the set-up parameters are lost and must be reentered. This includes the following:

- Host communication parameters (Chapter 3)
- Pen parameters (Chapter 4)
- Hardware scale factor (in this procedure)

Using default
plotter parameters

This procedure allows verifying and calibrating the hardware scale factors, if necessary.
To continue operations, proceed as follows:

Bad user number
using user #1

1. Press the lower right soft key. The plotter will go through a power-up initialization sequence for approximately 30 seconds.

2. Enter the host communications parameters in accordance with Chapter 3.

Using default
user parameters

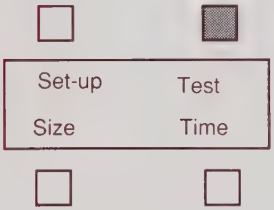
3. Enter the pen parameters in accordance with Chapter 4.

EEROM write
error Continue

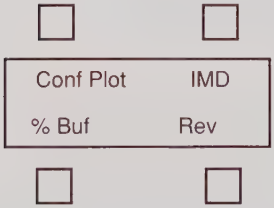
4. Verify or recalibrate the hardware scale factor as follows:

   a. Load a D-size sheet of polyester film and an extra fine liquid ink pen.

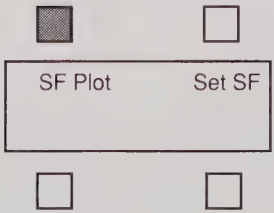
   b. Display page 3 of the main menu.



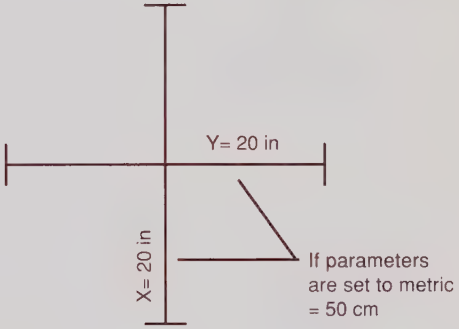
   c. Press the Test soft key. The following is displayed:



   d. Press the NEXT key. The following is displayed:



   e. Press the SF Plot soft key. The plotter draws the following:



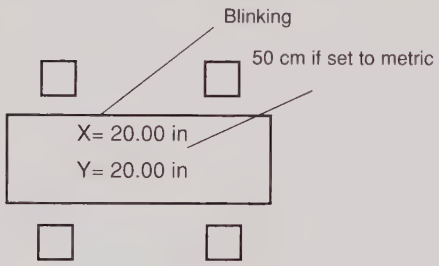
   f. Remove the drawing and measure the x and y axes.

   g. If either axis differs from the 20 inches or 50 centimeters, the dimensions can be reentered. The plotter accepts values from 19.020 to 20.080 inches or 49.800 to 50.200 centimeters.

   h. To enter new dimensions, perform steps i through m. If the dimensions are correct, proceed to step m.

   i. Load a new sheet of media and perform steps b through d.

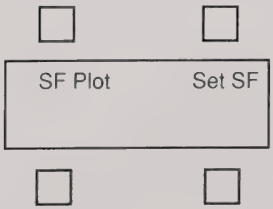
j. Press the Set SF soft key, the following is displayed:



k. Pressing the top soft keys allows access to the x-axis field. Pressing the bottom soft keys allows access to the y-axis field.

l. Use the numeric/axis direction keys to enter the measured values from step f for either or both axes that require correction.

m. Press the EXIT key. The following is displayed:



The new hardware scale factors are now saved.

DIAGNOSTIC INFORMATION

The following procedures can be used if diagnostic information is requested during a service call. There are three types of diagnostic information that can be obtained from these procedures:

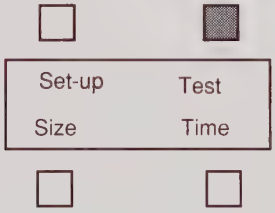
- Percent of Buffer Usage
- Input Monitor Dump (IMD)
- Firmware Revision Level

Percent of Buffer Usage

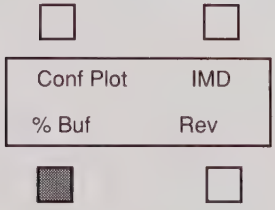
This option allows displaying the percentage of the input buffer that is being used to hold plot data during the Online mode. This option also displays the percentage of the sorted vector memory being used to hold plot data for the plot manager.

To use this option, proceed as follows:

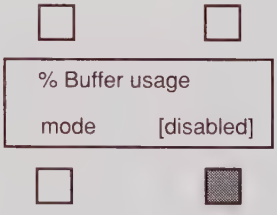
1. Display page 3 of the main menu.



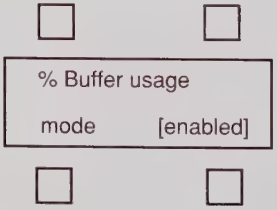
2. Press the Test soft key. The following is displayed:



3. Press the % Buf soft key. The following is displayed:

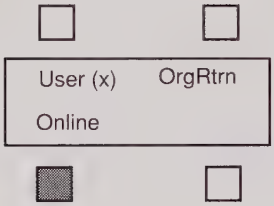


4. Press the [disabled] soft key. The following is displayed:

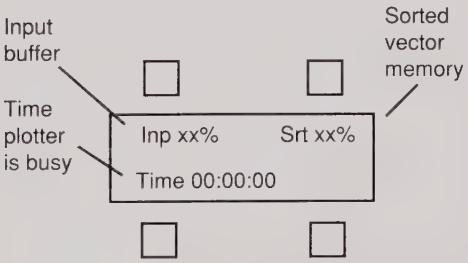


This enables the buffer for display.

5. Press the EXIT key three times. The following is displayed:

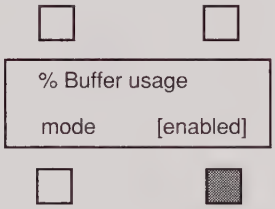


6. Press the Online soft key. The following is displayed:



7. Run the plot from the host computer. The display shows the percentage of the input buffer that is used and the percentage of sorted vector memory used.

8. Press the EXIT key to exit this option. The following is displayed:



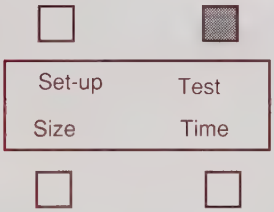
9. Press the [enabled] soft key. The display indicates [disabled]. This disables this option.

Input Monitor Dump (IMD)

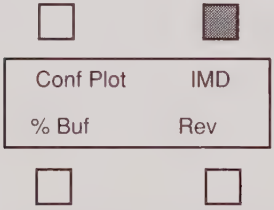
This option is useful for printing the host communications set-up parameters and the plot data. The plot data is printed in hex and ASCII format and may occupy more than one sheet, dependent upon the amount of plot data.

To use this option, proceed as follows:

1. Display page 3 of the main menu.



2. Press the Test soft key. The following is displayed:



3. Press the IMD soft key. The following occurs:

   a. The plotter prints the host communications parameters for the current user number.

   b. Send plot data from the host. The plotter will print the data.

4. If it is necessary to print more than one page of plot data, the following is scrolled on the display:

   Please load new media, then press continue.

5. At this time, the pinch rollers can be raised and the existing media replaced with a new sheet (subsequent page).

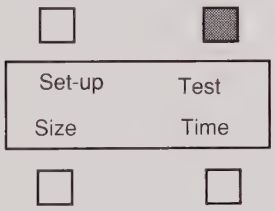
6. Press the Continue soft key to continue the IMD dump.

7. The media is sized and the plotter continues printing IMD data. This process continues, until the data is all printed or the option is aborted.

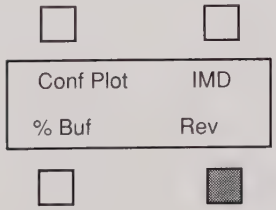
Firmware Revision

This option allows displaying the revision level of the firmware residing in the plotter. To use this option, proceed as follows:

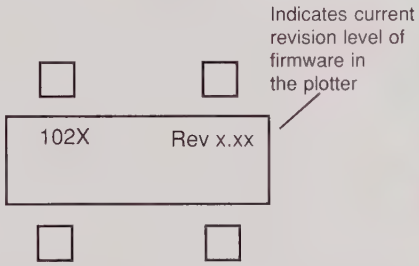
1. Display page 3 of the main menu.



2. Press the Test soft key. The following is displayed:



3. Press the Rev soft key. The following is displayed:



4. Press the EXIT key twice to exit this option.

APPENDICES

APPENDIX A
SPECIFICATIONS

MEDIA WIDTH:
ANSI A-D
ISO A4-A1
Architectural A-D

PERFORMANCE:

Acceleration:	2.0g (2.8g at 45° diagonal)
Speed:	30 ips/762 mmps (42 ips/1077 mmps at 45° diagonal)
Resolution:	0.0005 in/.0125 mm
Repeatabiltiy: (single pen)	0.005 in/.127 mm
Accuracy:	0.1% of the move up to 36 in/914 mm or .010 in/0.254 mm, whichever is greater.*

* On double-matte polyester film (3 mil) within a 5° range between 15°C and 35°C.

PENS:

Number of pens:	8
Pen Types:	Liquid ball (WLB) .011 to .013 in/ .28 to 33 mm Plastic tip (WWP) .012 in/.30 mm Plastic tip (WFP) .025 in/.64 mm Disposable liquid ink (WL, WT) .01 in/.25 mm to .028 in/.70 mm Refillable liquid ink (7T, 7L) .01 in/.25 mm to .027 in/.69 mm
Pen Select Time:	4.58 seconds

PHYSICAL:

Width:	37 in.
Depth:	16 in.
Height:	41 in.
Weight:	84 lbs

POWER REQUIREMENTS:

Voltage:	90 to 132 Vac or 180 to 264 Vac
Frequency:	47 to 63 Hz
Current:	0.75 to 1.0 amp (90 to 132 Vac)
	0.40 to 0.6 amp (180 to 264 Vac)
Peak Watts:	120
Avg. Watts:	90
BTU/hr.	306

ENVIRONMENT:

Noise:	65 dBa (operating)
	55 dBa (power-on idle)
Temperature:	
Storage:	-29°C to 70°C
	20°F to 158°F
Operating:	15°C to 35°C
	59°F to 95°F
Humidity:	20 to 80 percent relative, noncondensing
Altitude:	0 to 8,000 feet
EDS Immunity:	25 kV (no component damage)

STANDARD EQUIPMENT:

One Model 1023 plotter
One 1023 User's Guide
One 1023 Quick Reference Guide
One RS-232C interface
One package of four liquid ball pens
One power cord (8ft/2.4 m)
One grit cleaning brush
One package of six cut-sheet 23.4 by 33.1 inches A1-600, 22-pound bond paper
One 8-pen turret

OPTIONAL FEATURES:

HCBS software
Reticle
Additional pen turret
Premium pen kit (includes reticle)
RS-232C cable (10 or 25 feet)
Memory expansion cartridge and ADI driver

INTERNATIONAL POWER CORD CONFIGURATIONS

The international power configuration has a detachable power cord. If the supplied power cord is not compatible with your power outlet, read the following:

- The power cord must have a CEE-22 female connector.

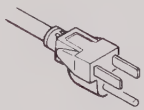
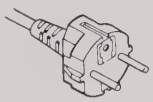
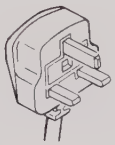
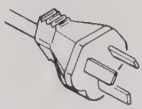
- Power cords used in Europe must be harmonized and designated with an HAR marking on the outside of the cord jacket. This is necessary to comply with the CENELEC Harmonized Document HD-21.

- U.S. power cords must be UL recognized (stamped on cord jacket) and CSA certified (label on cord jacket).

- Any power cord must also conform to local safety standards.

- See Table A-1 for examples of international power cords.

TABLE A-1. INTERNATIONAL POWER CORDS

CORD TYPE	AC VOLTAGE	CONNECTOR	CALCOMP PART NUMBER
U.S./Canada/Japan NEMA5-15P Male Connector UL Recognized CSA Certified	100 or 120 Vac 50 or 60 Hz Single-Phase		645150-4
Continental European CEE7-7 (Schuko) Male Connector Harmonized Cord	220 or 230 Vac 50 Hz Single-Phase		682170-6
Great Britain BS 1363 Male Connector W/Fuse Harmonized Cord	240 Vac 50 Hz Single-Phase		693750-2
Australia AS 3112-1981 Male Connector	240 Vac 50 Hz Single-Phase		693740-3

APPENDIX B
CPGL INFORMATION

This appendix is a summary of the CalComp Plotter Graphics Language (CPGL) and Hewlett Packard Graphics Language (HPGL) commands recognized by the Artisan plotter.

CALCOMP PLOTTER GRAPHICS LANGUAGE

CalComp designed the CalComp Plotter Graphics Language (CPGL) to allow users to connect their plotter to most Hewlett Packard Graphics Language (HPGL) RS–232C data sources (software programs). The CPGL and HPGL graphics languages share many commands in common. However, some HPGL commands are not supported by CPGL. These are listed in Tables B-1 (unsupported A features) and B-2 (unsupported B features). The CPGL command set is listed in Table B-3. Table B-3 also includes the command symbol, the command operation, and its compatibility to HPGL.

Your CAD programs should communicate with the plotter using the appropriate graphics language without your intervention. Very few graphics packages allow you to embed your own commands. Therfore, under most circumstances, you never need to use these graphic commands. The three tables that follow are shown for reference only.

UNSUPPORTED HPGL A FEATURES

Table B-1 lists all HPGL A features not supported by CPGL.

TABLE B-1. UNSUPPORTED HPGL A FEATURES

Digitize Commands	
DC	Digitize Clear
DP	Digitize Point
OD	Output Digitized Point and Pen Status
User-Defined Character Command	
UC	User-Defined Character
Return Character Size and Shape Commands	
IC	Input Character for sizing
OB	Output Box dimensions of character previously input via IC

UNSUPPORTED HPGL B FEATURES

Table B-2 lists all HPGL B features not supported by CPGL.

TABLE B-2. UNSUPPORTED HPGL B FEATURES

Characters	
DL	Down-Loadable Character
CM	Character Selection Mode
DS	Designate Character Set Into Slot
IV	Invoke Character Slot
Plotting with Roll Media	
EC	Enable Cut Line
AF/PG	Advance Full Page
AH	Advance Half Page
FR	Advance Frame
RS-232C Device Control	
ESC.A	Output Identification
ESC.P	Set Handshake Mode
ESC.Q	Set Monitor Mode
ESC.R	Reset
ESC.S	Output Memory Size
ESC.T	Configure Memory

If you have any other questions about unsupported HPGL features, Contact a CalComp Sales and Support Office listed in Appendix C.

Differences Between CPGL and HPGL Command Sets

Some HPGL A features are not emulated exactly by CPGL. These differences are:

- The IMPUT MASK (IM) command does not affect the error LED since there is none on the plotter.
- Proportional spacing of text is not supported by CPGL. Character sets have similar but not identical shapes. Italic angles cannot exceed 45 degrees.
- The CPGL coordinate system is oriented with +X going from front to back and +Y going from right to left. Some of Hewlett Packard plotter coordinates are oriented in the same manner. However, other Hewlett Packard plotter coordinates are rotated 180 degrees.
- Line types are drawn in the same way as HPGL except line type 0.
- The number of segments in an adaptive dash line may differ by one in some cases.
- There may be differences related to speed, number of pens, and other physical plotter differences.
- After receiving an effective window command, the pen will be moved to the MIN position. The pen then moves to the MAX position and returns to the previous position instead of no action on HPGL.

CPGL Command Set

Table B-3 lists the command set for CPGL. This table provides information on the operation feature, its command symbol, the type of operation it performs, and its compatibility to HPGL. Responses to compatibility are as follows:

Compatible	=	The CPGL operation is compatible with HPGL.
Different	=	The CPGL operation is similar to HPGL; for differences, refer to the prior section, Differences Between CPGL and HPGL Command Sets.
No-op & flag	=	This operation is not supported, but a syntax error is reported in the flag status.
N/A	=	This command is not available and the "Invalid Command Received" message is displayed.

TABLE B-3. CPGL COMMAND SET

Symbol	Operation	Operation Type	Compatibility
AA	Arc Absolute	Circles, Arc, Polygons	Compatible
AF	Advance Full Page	Plotting w/Roll Media	N/A
AH	Advance Half Page	Plotting w/Roll Media	N/A
AP	Auto Pen Pickup	Pen Control & Plotting	No-op & flag
AR	Arc Relative	Circles, Arc, Polygons	Compatible
AS	Acceleration Select	Pen Control and Plotting	No-op & flag
BL	Buffered Label String	Characters	Compatible
CA	Alternate Character Set	Characters	Different
CC	Character Chord	Characters	Different
CI	Circle	Circles, Arc, Polygons	Compatible
CM	Character Select Mode	Other Character Mode Select	N/A
CP	Character Plot	Characters	Compatible
CS	Standard Character Set	Characters	Different
CT	Chord Tolerance	Circles, Arc, Polygons	Compatible
DC	Digitize Clear	Digitizing	N/A
DF	Default	Device Control	Different
DI	Absolute Distance	Characters	Compatible
DL	Down-Loadable Character	Characters	N/A
DP	Digitize Point	Digitizing	N/A
DR	Relative Direction	Characters	Compatible
DS	Character Set in Slot	Other Character Mode Select	N/A
EA	Edge Rectangle	Circles, Arc, Polygons	Compatible
EC	Enable Cut Line	Plotting with Roll Media	N/A
EP	Edge Polygon	Circles, Arc, Polygons	Compatible
ER	Edge Rectangle	Circles, Arc, Polygons	Compatible
ES	Extra Space	Characters	Compatible
ESC.(	Plotter On	RS-232C Device Control	Compatible
ESC.)	Plotter Off	RS-232C Device Control	Compatible
ESC.@	Set Plotter Configuration	RS-232C Device Control	Compatible
ESC.A	Output Identification	RS-232C Device Control	Compatible
ESC.B	Output Buffer Space	RS-232C Device Control	Compatible
OSC.E	Outpout Extender Error	RS-232C Device Control	Compatible
ESC.H	Set Handshake Mode 1	RS-232C Device Control	Compatible
ESC.I	Set Handshake Mode 2	RS-232C Device Control	Compatible
ESC.J	Abort Device Control	RS-232C Device Control	Compatible
ESC.K	Abort Graphics	RS-232C Device Control	Compatible
ESC.L	Output Buffer Size	RS-232C Device Control	Compatible

TABLE B-3. CPGL COMMAND SET — Continued

Symbol	Operation	Operation Type	Compatibility
ESC.M	Set Output Mode	RS-232C Device Control	Compatible
ESC.N	Set Extended Output Handshake	RS-232C Device Control	Compatible
ESC.O	Output Extended Status	RS-232C Device Control	Compatible
ESC.P	Set Handshake Protocol	RS-232C Device Control	N/A
ESC.Q	Set Monitor Mode	RS-232C Device Control	N/A
ESC.R	Reset	RS-232C Device Control	N/A
ESC.S	Output Memory Size	RS-232C Device Control	N/A
ESC.T	Configure Memory	RS-232C Device Control	N/A
ESC.Y	Plotter On	RS-232C Device Control	Compatible
ESC.Z	Plotter Off	RS-232C Device Control	Compatible
EW	Edge Wedge	Circles, Arc, Polygons	Compatible
FP	Fill Polygon	Circles, Arc, Polygons	Compatible
FR	Advance Frame	Plotting with Roll Media	N/A
FS	Force Select	Pen Control and Plotting	No-op & flag
FT	Fill Type	Circles, Arc, Polygons	Compatible
GP	Group Pen	Pen Control and Plotting	Compatible
IM	Input Mask	Program Instructions	Different
IN	Initialize	Device Control	Different
IP	Input P1 / P2	Scale/Window/Rotate	Compatible
IV	Invoke Character Set	Other Character Mode Select	N/A
IW	Input Window	Scale/Window/Rotate	Different
LB	Label	Characters	Different
LO	Label Origin	Character	Compatible
LT	Line Type	Plot Enhancement	Different
NR	Not Ready	Device Control	Compatible
OA	Output Actual Position/Pen	Program Instructions	Different
OC	Output Commanded Position/Pen	Program Instructions	Different
OD	Output Digitized Point/Pen	Digitizing	N/A
OE	Output Error	Program Instructions	Compatible
OF	Output Factors	Program Instructions	Compatible
OH	Output Hard Clip Limits	Scale/Window/Rotate	Compatible
OI	Output Identification	Program Instructions	Compatible
OL	Output Label Length	Characters	Different
OO	Output Options	Program Instructions	Compatible

TABLE B-3. CPGL COMMAND SET — Continued

Symbol	Operation	Operation Type	Compatibility
OO	Output Options	Program Instructions	Compatible
OP	Output P1 / P2	Scale/Window/Rotate	Compatible
OS	Output Status	Program Instructions	Compatible
OT	Output Turret Type	Program Instructions	Different
OW	Output Windowing	Scale/Window/Rotate	Compatible
PA	Plot Absolute	Plotting with Variables	Compatible
PB	Print Buffered Label	Characters	Compatible
PD	Pen Down	Plotting with Variables	Compatible
PG	Advance Full Page	Plotting with Roll Media	N/A
PM	Ploygon Mode	Circles, Arc, Polygons	Compatible
PR	Plot Relative	Plotting with Variables	Compatible
PT	Pen Thickness	Cirlcles, Arc, Polygons	Compatible
PU	Pen-Up	Plotting with Variables	Compatible
RA/RR	Fill Rectangle	Circles, Arc, Polygons	Compatible
RO	Rotate Coordinates	Scale/Window/Rotate	Compatible
SA	Select Alternate Set	Characters	Compatible
SC	Scale	Scale/Window/Rotate	Compatible
SG	Select Pen Group	Pen Control and Plotting	Compatible
SI	Absolute Character Size	Characters	Compatible
SL	Character Slant	Characters	Different
SM	Symbol Mode	Plot Enhancement	Different
SP	Pen Select	Plotting with Variables	Compatible
SR	Relative Character Size	Characters	Compatible
SS	Select Standard Set	Characters	Compatible
TL	Tick Length	Plot Enhancement	Compatible
UC	User-Defined Character	Characters	N/A
UF	User-Defined Fill Type	Circles, Arc, Polygons	Compatible
VS	Velocity Select	Pen Control and Plotting	No-op & flag
WG	Fill Wedge	Circles, Arc, Ploygons	Compatible
XT	Tick X-Axis	Plot Enhancement	Compatible
YT	Tick Y-Axis	Plot Enhancement	Compatible

APPENDIX C
OBTAINING SUPPLIES/SERVICE

SUPPLIES

If you are within the continental United States, call *1-800-CALCOMP*. If you are outside of the continental United States, refer to the listing contained in this appendix, and contact the office in your area.

SERVICE

If you are within the continental United States, contact the dealer from whom the plotter was purchased. If additional assistance is required, call *1-800-CALCOMP*. If outside the continental United States, refer to the listing contained in this appendix and contact the office in your area.

When requesting service from a CalComp office, please have the following information available:

- Plotter model number
- Plotter serial number
- Host computer/modem type attached to plotter
- Applications software being used
- Pens and media being used
- Dealer from whom the plotter was purchased
- If the warranty has expired, the date the plotter was purchased

Subsidiaries and Affiliates

Belgium
N.V. CalComp S.A.
Tollaan-Avenue Du Peage 105A
1940 Sint-Stevens Woluwe
Woluwe, Saint-Etienne
02-7212930
Telex 23913 calcomp b

Canada
CalComp Canada
401 Champagne Drive
Downsview, Ontario
M3J 2C6
(416) 635-9010
FAX (416) 633-5103

CalComp Canada
3445 Rue Ashby
St. Laurent, Quebec
H4R 2K3
(514) 336-2624
Telex 05 824996

CalComp Canada
650 Graham Bell
Chambre 212
Ste. Foy, Quebec
G1N 4H5
(418) 683-1509

CalComp Canada
Suite 105, E Tower
1144 29th Avenue N.E.
Calgary, Alberta
T2E 7P1
(403) 250-5555
Telex 03 821621

CalComp Canada
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Richmond, British Columbia
V6X 3C6
(604) 270-6276
Telex 04 355873

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120 Highway 15, Suite 206
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Telex 8584661
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Telex 522 929

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20090 Milanofiori Assago (MI)
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Telex 312360 CCPMI
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CalComp S.p.A.
Viale Masini, 20
40126 Bologna
39 51 352540

CalComp S.p.A.
Via Thailandia, 27
00144 Roma
39 6 5914402

Japan
Nippon CalComp K.K.
7-1 Irifune 3 Chome
Chuo- Ku, Tokyo 104
03 555 8911
Telex J26242 CalComp
FAX 81-35558913

Nippon CalComp K.K.
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FAX 341215

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Ing. Helmut Pertusini
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(02236) 22002

Denmark
BLT Periferi A/S
Vermundsgade 19
2100 Copenhagen
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01 813600
Telex 19496 BLTDK DK
FAX 01 820218

Finland
O.Y. Mercantile A.B.
Data Department
P.O. Box 129
00701 Helsinki 70
Finland
0 34501
Telex 124416 merc sf
FAX 0 3450368

Ireland
McGrane Computer Systems Ltd.
36 Lad Lane
Dublin 2, Ireland
353 1 612010
Telex 91195

Norway
Morgenstierne & Co. AS
Postboks 6688 Rodelokka
Oslo 5, Norway
2 356110
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FAX 01 820218

Portugal
Basedois, LDA
Informatica e Telecomunicacoes
Rua Jardim do Tabaco 74-1
1100 Lisboa, Portugal
351-1-869927
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Yugoslavia
Sozd Elektrotehna Do Junal
Tozd Elzas
Titova 81
6100 Ljubljana
Yugoslavia
1 318681
Telex 31767 yu elzas
FAX 61 328744

Americas, Middle East & Pacific Distributors

Budde International Inc.
520 North Brookhurst Street
Suite 220
Anaheim CA 92801 U.S.A.
(714) 772-2288
TELEX: 1561141 BUDDE INC

For the name and address of CalComp product distributors in the following territiories/ countries, please contact Budde International Inc.

American Samoa
Angola
Antigua and Barbuda
Argentina
Australia
Bahamas
Bangladesh
Barbados
Belize
Bermuda
Bolivia
Brazil
Brunei
Burma
Cayman Islands
Chile
China (Republic of Taiwan)
Columbia
Costa Rica
Dominican Republic
Ecuador
El Salvador
Egypt
Fiji
Greece
Grenada
Guadeloupe & Dependencies
Guam
Guyana
Guatemala
Haiti
Honduras
India
Indonesia
Israel
Jamaica
Jordan
Korea (South)
Kuwait
Laos
Lebanon
Madagascar
Malawi
Malaya
Malaysia
Maldives
Martinique
Mauritius
Mexico
Midway Islands
Mozambique
Namibia
Netherlands Antilles
New Zealand
Nicaragua
Oman
Pacific Islands (Territory of)
Pakistan
Panama
Papua New Guinea
Paraguay
Peru
Philippines
Puerto Rico
Qatar
Sabah
Saint Christopher and Nevis
St. Helena & Dependencies
Saint Lucia
Saint Vincent & The Grenadines
Sarawak
Saudi Arabia
Seychelles
Singapore
Solomon Islands
South Africa
Sri Lanka
Taiwan
Thailand
Tokelau
Tonga
Tristan Da Cunha
Turkey
Tuvalu
United Arab Emirates
Uruguay
Vanuatu
Venezuela
Virgin Islands, U.S.A.
Wake Island
Wallis and Futuna
Western Samoa
Zimbabwe

GLOSSARY

GLOSSARY

Acceleration - The rate at which the pen moves to maximum plot speed relative to the media.

Accuracy - The difference between the commanded end-point and the actual end-point.

ACK/NAK- A coded response from the plotter to the host sent via the RS-232C data line. ACK= Data received from the host is OK NAK= Data received from the host has an error, please send data again.

Baud Rate - The data transmission rate over an RS-232C communications path, usually expressed in bits per second (bps).

Buffer Usage Test - (% Buf) - Determines percentage of memory being used to plot data.

Checksum - A method of checking a block of data by applying an algorithm to each byte in the block of data. The resulting checksum character is appended as the last byte in the block. When data is sent from the host, the checksum character sent from the host is compared with the received checksum. If the checksum characters match, it is assumed that the transmitted data is the same as the received data. If they don't match, it is assumed the data is bad.

CLCMP - A set-up option when using CPGL mode. CLCMP = CalComp as the plotter type.

CPGL - A protocol that emulates the Hewlett Packard Graphics Language (HPGL) and allows CalComp plotters to operate with software that uses HPGL.
CPGL= CalComp Plotter Graphics Language

Data Byte Format - Used in PCI and CPGL formats to set stop bits and parity.

DCE - (Data Communications Equipment) - An RS-232C configuration where data is transmitted on pin 3 and received on pin 2.

Direct Control - An RS-232C protocol that uses high quality cabling that is limited to 50 feet or less.

DTE - (Data Terminal Equipment) - An RS-232C configuration where data is transmitted on pin 2 and received on pin 3.

End-of-Message Character - A character transmitted after each record is sent to indicate the end of a data block.

Forms Alignment - An option used with gridded media and preprinted forms to align the media to the plotters X and Y axes.

Handshake - RS-232C communications between a host and the plotter about the availability of I/O buffer space. A handshake ensures correct and complete data transfer.

HPGL - (Hewlett Packard Graphics Language) - The graphics instruction set used for communication with Hewlett Packard plotters.

IMD - (Input Monitor Dump) - A test used to indicate what plot data has been sent from the host computer.

ISO - International Standards Organization for Engineering drawings.

Limit - Defines an image area for the plot to be drawn. The image outside of the limits is excluded from the plot.

Origin - The origin is the point at which the plotter enters the Online mode.

Origin Return - An option that allows the plotter to return to the origin point.

P1 - A scaling point that generally specifies the location of a plot's lower left corner.

P2 - A scaling point that generally specifies the location of a plot's upper right corner.

Parity - An error checking scheme used when transferring binary data. Parity may be even or odd, or none. With odd parity, a parity bit is added to an even number of bits to make the total odd. With even parity, a bit is added to an odd number of bits to make the total even. A parity error occurs with odd parity, when an odd number of bits (including parity) are transmitted and an even number are received. An even parity error is the converse of an odd parity error.

PCI Mode - Plotter Communication Interface (an extended version of 907 formatted data).

Pen Force - The magnitude of the force required to hold the pen on the media (the larger the number the greater the magnitude).

Plot Manager - A CalComp proprietary algorithm that minimizes pen changes and movement, thus enhancing throughput.

Repeatability - A measure of how closely a device can return a pen to the previously plotted point.

Resolution, Addressable - The smallest move that the user can specify programmatically.

Resolution, Mechanical - The smallest move the plotter can make in any direction.

Reticle - An optical device used to position media accurately.

Plot Speed - Plot speed is expressed as Axial or Diagonal. Axial plot speed is the speed at which a plotter can draw a straight line on the X or Y axis. Diagonal plot speed is the speed at which the plotter can draw a line at 45 degrees.

Stop Bit - In asynchronous transmission mode, a bit that indicates the end of the data byte being transmitted.

Sync Character - A character periodically transmitted from the transmitting device to the receiving device as a check on its synchronization with the sending device. It marks the beginning of a PCI block (or record).

Sync Character Value - The numeric value of the sync character.

XON / XOFF - A coded response from the plotter to the host sent via the RS-232C data line. XON= Send more data. XOFF= Data buffer full, do not send more data. There is no error recovery capability as in ACK/NAK protocol.

CalComp
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